

GLOBAL BRAIN CHIP AND MESOGENS

Nano Machines for Ultimate Control of False Memories

Dr. Hildegarde Staninger™, RIET1

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Presented at the 3rd Annual War Council of the Natural Solutions Foundation on
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Our world is made up of various elements, as you'll remember if you ever sat and stared at the periodic table in science class for many hours trying to understand the utilization of elements into compounds and their "3-D" structural composition. These elements are now used at 50 atoms units in the "nano world" to make the individual building blocks of nanotechnology. Nanotubes, nano-spacers, nano-rods, nano-wires and many other single components are even utilized to make the nano-radio, as used in nano medicine. We are a carbon friendly world which forms very strong covalent bonds; bonds in which atoms share electrons with each other, such as in the 3-D crystalline lattice of a diamond. Now, these elemental ingredients are in the laboratory's cauldron of nano ingredients to make different forms of mesogens. Mesogens are liquid crystals that have not only a specific smart function, but are used as the platform in developing new thin film transmitting nano ultra thin film coatings for biological sensors that have been used in "Brain Chip" mesogenic bio-sensors.

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Introduction

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3-D crystalline lattice of a diamond. Now, these elemental ingredients are in the laboratory's cauldron of nano ingredients to make different forms of mesogens. Mesogens are liquid crystals that have not only a specific smart function, but are used as the platform in developing new thin film transmitting nano ultra thin film coatings for biological sensors that have been used in "Brain Chip" mesogenic bio-sensors.

William E. Halal, *Emerging Technologies and the Global Crisis of Maturity* said,

"Although technological powers will be vast and progress will likely be made, the normal level of social resistance and political statement is likely to oppose change. Thus it may take an occasional environmental collapse, global wars and terrorist, or get unknown calamities to force the move to global consciousness."

Even the NASA inventor and author, Ray Kurzweil in his book, *The Singularity is Near*, stated that by 2035, an implantable information chip could be developed and wired directly to the user's brain. The reality is that it is happening now through the advancements of sciences, computers, semiconductors, engineering, medicine, chemistry, and many other disciplines of science and engineering.

This paper will address a specific case study of the removal of a meningioma, non-cancerous brain tumor, which in reality turned out to be a reactive nematic mesogen composed of advanced nano material brain chip/sensor for brain-computer interface. Additional mesogens will be discussed that were isolated from various human body surfaces and, specifically, from three different individual nasal passages, within a week of each other, that crossed the United States and Saudi Arabia.

Mesogens: Their Use in Building Nano-Biosensor Brain Chips

Mesogens are any compound that can exist as a mesophase and that part of the molecule of a liquid crystal that is responsible for its particular properties. In medicine, the term "mesogenic" pertains to, or is relating to, the capacity of a virus to lethally infect embryonic hosts after a short

incubation period, but is incapable of infecting immature and adult hosts. In other words, the mesogen has a host-parasitic relationship in which the parasite dominates, but the host usually survives.^{1, 2} This statement is right on target for how the mesogenic liquid crystal phase, and its other nano architectural designed smart functions, would interact with the biological system of the human brain or other target organs of designed choice. Mesogenic payloads of liquid crystals can be unreactive until triggered into activation for their ultimate purpose. This is the new nano medicine, new smart WIFI communication system, weapon, industrial espionage device, or component for mind or body control devices. In the nanotech world, there are no limits. It is the same with various types of mesogens. (See Figure 1)

To understand the technology of mesogens and their multiple smart functional uses for sensing, payload delivery systems, and other related aspects of their design, one must always remember that the mesogen is the tool or device – like the wheel on a car for the nano machine. The nano machine can be designed to become the robot, surgical scalpel, camera, the voice within your skull, or even the “false” collective consciousness when integrated into a computer system for collective mind control or a “global brain.”

Types of Mesogens and Their Liquid Crystal Phases

A mesogen is primarily composed of liquid crystalline segmented copolymers systems that are composed of thin films of isotactic compounds that contain nano wires, tubes and other similar materials. They can function as sensors, transducers, actuators, and other related devices that are utilized in neurological mechanical device application or internal biological monitoring system.

The side chain of the liquid crystalline compounds create new closes of materials that offer the potential to couple the response of liquid crystals and elastomeric networks to applied mechanical strains. In the activation and design of functional strength and/or size parameter - such as pH, halogens, frequency (type) - hard and soft continuous domains and solvent solubility play vital roles in its design from nano material building units into an actual functional nano machine.

While liquid crystals are a state of matter that have properties between those of conventional liquid and those of a solid crystal, they can be divided into thermotropic, lyotropic, and metallotropic phases. Thermotropic and lyotropic LCs consist of organic molecules. Thermotropic LCs exhibit a phase transition into the LC phase as temperature is changed. Lyotropic LCs exhibit phase transitions as a function of both temperature and concentration of the LC molecules in a solvent (typically water). Metallotropic LCs are composed of both organic and inorganic molecules. Their LC transition depends not only on temperature and concentration, but also on the inorganic-organic composition ration. Liquid crystals can be found both in the natural world and in technological applications. Most modern electronic displays are liquid crystal based. Lyotropic liquid-crystalline phases are abundant in living systems. For example, many proteins and cell membranes are LCs. Other well-known LC examples are solutions of soap and various related detergents, as well as the tobacco mosaic virus; all of which have been made into viral crystal protein envelops.

Liquid Crystal Phases

Liquid crystals were first examined in 1888 by Austrian botanical physiologist Friedrich Reinitzer, working at the *Charles University* in Prague, as he examined the physic-chemical properties of various derivatives of cholesterol, which are now known as cholesteric liquid crystals. Previously, other researchers had observed distinct color effects when cooling cholesterol derivatives just above the freezing point, but had not associated it with a new phenomenon. Reinitzer perceived that color changes in a derivative cholesteryl benzoate were not the most peculiar feature. He found that cholesteryl benzoate does not melt in the same manner as other compounds, but has low melting points. At 145.5 degrees Celsius it melts into a cloudy liquid, and at 178.5 degrees Celsius, it melts again and the cloudy liquid becomes clear. The phenomenon is reversible. This intermediate cloudy fluid with crystallites was called "liquid crystals."^{3a,3b} (See Table 1)

The various liquid crystal phases (called mesophases) can be characterized by the type of ordering. One can distinguish positional order (whether molecules are arranged in any sort of ordered lattice) and orientational order (whether molecules are mostly pointing in the same direction) and, moreover, order can be either short-range (only between molecules close to each other) or long-range (extending to larger, sometimes macroscopic, dimensions). Most thermotropic liquid crystals will have an isotropic phase at high temperature, whereby heating will eventually drive them into a conventional liquid phase characterized by random and isotropic molecular ordering (little to no long-range order) and fluid-like flow behavior. Under other conditions, such as lower temperatures, an LC might inhabit one or more phases with significant anisotropic orientational structure and short-range orientational order while still having an ability to flow.

The ordering of liquid crystalline phases is extensive on the molecular scale. This order extends up to the entire domain size, which may be on the order of micrometers, but usually does not extend to the macroscopic scale as often occurs in classical crystalline solids. However, some techniques such as the use of boundaries or an applied electric field (use of nano piezoelectrical materials) can be used to enforce a single ordered domain in a macroscopic liquid crystal sample. The ordering in a liquid crystal might extend along only one dimension, with the material being essentially disordered in the other two directions.

Liquid Crystal Elastomers (LCE)

Liquid crystal elastomers are dependent upon connectivity and conformation. Two polymer network conformations currently exist for LCE materials: Side chain LCE (SCLCE) and Main chain LCE (MCLCE) as illustrated in *Figure 1*. The side chain conformation has the LC mesogen pendant from the linear polymer network. The main chain LCE has the LC mesogens linked end to end forming a LC polymer which is cross-linked to form the network. Either nematic or smectic LCE may be prepared from side chain and main chain LCE. Some examples are the following:

- Acrylate side chain LCE – side chain LCE prepared through photopolymerization of acrylate mesogens. (*See Figure 2*)
- Siloxane side chain LCE – side chain LCE prepared via hydrosilylation reaction of vinyl mesogen with methyl-hydrosiloxane polymer.

Materials of this type also include LCE films/ultra thin films (coatings).³
(See Figure 3)

- Main chain LCE – main chain LCE prepared via hydrosilylation reaction of vinyl mesogen with methyl hydrosiloxane polymer. (See Figure 4)
- Polyester/polyurethane (Estane) side chain LCE – side chain LCE segmented polyurethane with functionalized polysiloxane soft segments and traditional MDI/butane diol hard segment. (See Figure 5)

Discotic Liquid Crystals (DLC)

Discotic liquid crystals, which are generally denoted by their aromatic mesogens, take advantage of the proximity of the aromatic mesogen to allow charge transfer in the stacking direction through the “pi” conjugate systems. The charge transfer allows the discotic liquid crystals to be electrically semi-conductive along the stacking direction. Applications have been focusing on using these systems in photovoltaic devices, organic light emitting diodes (OLED) and molecular wires (nanowires).^{4, 5, 6} Discotics have also been suggested for use in compensation films, for LCD displays.

Photovoltaic devices – are discotic liquid crystals that have similar potential to the conducting polymers for their use in photovoltaic cells. They have the same technical challenges of low conductivity and sensitivity to UV damage as the polymer designs. However, one advantage is the self-healing properties of the discotic mesogens,⁷ so far as the photovoltaic applications have been limited, using perylene and hexabenzocoronene mesogens in simple two-layer systems resulted in ~2% power efficiency.⁸

Organic light emitting diodes – So far, the study into discotic liquid crystals for light emitting diodes are at its infancy, but there have been some examples produced: A triphenylene and perylene-mesogen combination can be used to make a red LED.⁹ The self-assembly properties make them more desirable for manufacturing purposes when producing commercial electronics than the currently used small molecule crystals, as in new commercial OLED displays. Also, they have the added benefit of self-healing properties that both the small molecule and the polymers lack as conductors, potentially being beneficial for longevity OLED products.

Thermotropic Liquid Crystals (TLC) or Thermotropic Crystal

Thermotropic phases are those that occur in a certain temperature range. If the temperature rise is too high, thermal motion will destroy the delicate cooperative ordering of the LC phase, pushing the material into a conventional isotropic liquid phase. At too low a temperature, most LC materials will form a conventional crystal.¹⁰ Many thermotropic LCs exhibit a variety of phases as temperature is changed. For instance, a particular type of LC molecule (called mesogen) may exhibit various smectic and nematic (and finally isotropic) phases as temperature is increased. An example of a compound displaying thermotropic LC behavior is paraazooxanizole.

Nematic Phase or Biaxial nematic and Twisted Nematic Field Effect

One of the most common LC phases is the nematic. The word *nematic* comes from the Greek *nema*, which means "thread." This term originates from the thread-like topological defects observed in nematics, which are formally called "disclinations." Nematics also exhibit so-called hedgehog topological defects. In a nematic phase, the calamitic or rod-shaped organic molecules have no positional order, but they self-align to have long range directional order with their long axes roughly parallel. Thus, the molecules are free to flow and their center of mass positions are randomly distributed as in a liquid, but still maintain their long-range directional order. Most nematics are uniaxials, meaning they have one axis that is longer and preferred with the other two being equivalent (can be approximated as cylinders or rods). However, some liquid crystals are biaxial nematics, meaning that in addition to orienting their long axis, they also went along a secondary axis. Nematics have fluidity similar to that of ordinary (isotropic) liquids, but they can easily be aligned by an external magnetic or electric field. Aligned nematics have the optical properties of uniaxial crystals and this makes them extremely useful in liquid crystal displays (LCD).

Smectic Phases

The smectic phases, which are found at lower temperatures than the nematic, form well defined layers that can slide from one another in a manner similar to that of soap. The smectics are thus positionally ordered along one direction. In the Smectic A phase, the molecules are oriented along the layer normal, while in the smectic C phase they are tilted away from the layer normal (See *Figures 6 A and B*). These phases are liquid-like

within the layers. There are many different smectic phases, all characterized by different types and degrees of positional and orientational order.^{11, 12}

Chiral Phases

The chiral nematic phase exhibits chirality (handedness). This phase is often called the cholesteric phase because it was first observed for cholesterol derivatives. Only chiral molecules (i.e. those that lack inversion symmetry) can give rise to such a phase. This phase exhibits a twisting of the molecules perpendicular to the direction with the molecular axis parallel to the direction. The finite twist angle between adjacent molecules is due to their asymmetric packing, which results in longer-range chiral order. In the smectic C* phase (an asterisk denotes a chiral phase), the molecules have positional ordering in a layered structure (as in the other smectic phases) with the molecules tilted by a finite angle with respect to the layer normal. The chirality induces a finite azimuthal twist from one layer to the next producing a spiral twisting of the molecular axis along the layer normal.¹³ (See Figure 7 and 8)

The chiral pitch, p , refers to the distance over which the LC molecules undergo a full 360 degree twist (but note that the structure of the chiral nematic phase repeats itself every half-pitch, since in this phase directors at 0 degrees and +/- 180 degrees are equivalent). The pitch, p , typically changes when the temperature is altered or when other molecules are added to the LC host (an achiral LC host material will form a chiral phase if doped with a chiral material), allowing the pitch of a given material to be tuned accordingly. In some liquid crystal systems, the pitch is of the same order as the wavelength of visible light. This causes these systems to exhibit unique optical properties - such as Bragg reflection and low-threshold laser emission¹⁴ - and these properties are exploited in a number of optical applications. For the case of Bragg reflection, only the lowest-order reflection is allowed if the light is incident along the helical axis; whereas, for oblique incidence, higher-order reflections become permitted. Cholesteric liquid crystals also exhibit the unique property that they reflect circularly polarized light when it is incident along the helical axis and elliptically polarized if it comes in obliquely.¹⁵

Blue Phases

Blue phases are liquid crystal phases that appear in the temperature range between a chiral nematic phase and an isotropic liquid phase. Blue phases have a regular three-dimensional cubic structure of defects with lattice periods of several hundred nanometers; thus, they exhibit selective Bragg reflections in the wavelength range of visible light corresponding to the cubic lattice. It was theoretically predicted in 1981 that these phases can possess icosahedral symmetry similar to quasicrystals.^{16, 17}

Although blue phases are of interest for fast light modulators or tunable photonic crystals, they exist in a very narrow temperature range, usually less than a few Kelvin. Stabilized at room temperature, blue phases allow electro-optical switching with response times of the order of 10^{-4} seconds.

Discotic Phases

Disk-shaped LC molecules can orient themselves in a layer-like fashion known as the discotic nematic phase. If the disks pack into stacks, the phase is called a discotic columnar. The columns themselves may be organized into rectangular or hexagonal arrays. Chiral discotic phases are similar to the chiral nematic phase. (*See Photomicrograph 1*)

Lyotropic Liquid Crystals

A lyotropic liquid crystal consists of two or more components that exhibit liquid-crystalline properties in certain concentration ranges. In the lyotropic phases, solvent molecules fill the space around the compounds to provide fluidity to the system. In contrast to thermotropic liquid crystals, these lyotropics have another degree of freedom of concentration that enables them to induce a variety of different phases.

A compound, which has two immiscible hydrophilic and hydrophobic parts within the same molecule, is called an amphiphilic molecule. Many amphiphilic molecules show lyotropic liquid-crystalline phase sequences depending on the volume balances between the hydrophilic part and the hydrophobic part. These structures are formed through the micro-phase segregation of two incompatible components on a nanometer scale. Soap is an everyday example of a lyotropic liquid crystal.^{17, 18}

The content of water or other solvent molecules changes the self-assembled structures. At very low amphiphile concentration, the molecules will be

dispersed randomly without any ordering. At slightly higher (but still low) concentration, amphiphilic molecules will spontaneously assemble into micelles or vesicles. This is done so as to “hide” the hydrophobic tail of the amphiphile inside the micelle core, exposing a hydrophilic (water-soluble) surface to aqueous solution. However, these spherical objects do not order themselves in solution. At higher concentrations, the assemblies will become ordered. A typical phase is a hexagonal columnar phase where the amphiphiles form long cylinders (again with a hydrophilic surface) that arrange themselves into, roughly, a hexagonal lattice. This is called the middle soap phase. At still higher concentration, a lamellar phase (neat soap phase) may form, wherein extended sheets of amphiphiles are separated by thin layers of water. For some systems, a cubic (also called viscous isotropic) phase may exist between the hexagonal and lamellar phases, wherein spheres are formed that create a dense cubic lattice. These spheres may also be connected to one another, forming a bicontinuous cubic phase. (*See Photomicrograph 2*)

The objects created by amphiphiles are usually spherical (as in the case of micelles), but may also be disc-like (bicelles), rod-like, or biaxial (all three micelle axes are distinct). These anisotropic liquid crystals do form large-scale versions of all the thermotropic phases (such as a nematic phase of rod-shaped micelles). At high concentrations, inverse phases are observed; that is, one may generate an inverse hexagonal columnar phase (columns of water encapsulated by amphiphiles) or an inverse micellar phase (bulk liquid crystal sample with spherical water cavities). A generic progression of phases, going from low to high amphiphile concentration, is as follows:

- Discontinuous cubic phase (micellar cubic phase)
- Hexagonal phase (hexagonal columnar phase) (middle phase)
- Lamellar phase
- Bicontinuous cubic phase
- Reverse Hexagonal Columnar phase
- Irreversible cubic phase (inverse micellar phase)

Metallotropic Liquid Crystals

Liquid crystal phases can also be based on low-melting inorganic phases like $ZnCl_2$ that have a structure formed of linked tetrahedral and easily form glasses. The addition of long chain soap-like molecules leads to a series of

new phases that show a variety of liquid crystalline behavior, as dual functions of the inorganic-organic composition ratio and of temperature. This class of material is known as metallotropic.

Biological Liquid Crystals

Lyotropic liquid-crystalline phases are abundant in living systems, the study of which is referred to as lipid polymorphism. Accordingly, lyotropic liquid crystals attract particular attention in the field of biomimetic chemistry. In particular, biological membranes and cell membranes are a form of liquid crystal. Their constituent molecules (phospholipids, acetylcholinesterase, enzymes, amino acids and other similar molecules) are perpendicular to the membrane surface, yet the membrane is flexible. These lipids vary in shape and can intermingle easily, but tend not to leave the membrane due to the high energy requirement of this process. Lipid molecules can flip from one side of the membrane to the other, a process catalyzed by flippases and floppases (depending on the direction of movement). These liquid crystal membrane phases can also host important proteins, such as receptors freely “floating” inside or partly outside the membrane.

Anisotropy of liquid crystals is a property not observed in other fluids. This anisotropy causes the flows of liquid crystals to behave differently than those of ordinary fluids. For example, injection of a flux of a liquid crystal - between two close parallel plates (viscous fingering) - causes orientation of the molecules to couple with the flow, with the resulting emergence of dendritic patterns. This anisotropy is also manifested in the interfacial energy (surface tension) between different liquid crystal phases and it determines the equilibrium shape at the coexistence temperature. It is so strong, facets usually appear. When temperature is changed, one of the phases grows which forms different morphologies depending on the actual temperature change. Since growth is controlled by heat diffusion, anisotropy in thermal conductivity favors growth in specific directions, which has also an effect on the final shape.

Defining Nano Advanced Materials and Their Use as a Biosensor (Brain Chip)

Many of us in the fields of Health, Safety, and Environmental Engineering have recognized complex mixtures that form when chemicals combine with

one another, which can create extremely hazardous situations. These materials are usually in the form of a solid, liquid, gas, or may be frozen as in a cryogenic substance. The difference with the nanostructures is based on their synthesis into a one-dimensional, two-dimensional, and now new three-dimensional forms. They use the same chemicals, but are now smart - like the Scarecrow in the Wizard of Oz movie who only wanted a brain. They have a brain because they can interface with computers through the transitional and piezoelectrical metallic materials they are made from. They can be a gel, particle, tube, claw, hook, fiber, or even a wire - but all exist under the penumbra of NANO.

In very recent press releases, nanowires are now being used in brain chips for the human brain so that a person can read the thoughts of another or transfer his thoughts to them. It is even being used for instantaneous language learning and retention. Nanowires are particularly interesting as they offer the opportunity to investigate electrical and thermal transport processes in size-confined systems (like the brain, human body, or even a plant) with the possibility of providing a deeper understanding of physics and other related sciences at a nanoscale. Silicon and silica nanostructures have attracted considerable attention because of their potential application in mesoscopic research and the development of nano-devices (tools and machines). The potential use of large surface area structures for catalysis or piezoelectrical thin film nanotechnology will be a whole new arena.

The growth of nano silica structures initiates from nanofibers composed of tiny amorphous particles. Aligned fiber arrays appear to grow from a single or biaxial nanofiber and have a structure similar to a protozoa and its "flagellum" (See Figure 9 A). The width of the bundle is 300-500 nm. Wang, *et al*, in 2000 observed that, after reaching a certain length, the silica fibers in the interior of the bundle cease growth while those in the outer regions continue to grow, forming a cylindrical chamber. Energy dispersive X-ray spectroscopy reveals small crystalline Si nanoparticles impregnated in the silica cylinder. Further growth of the nanofibers forms larger silicon (EDS) wire-like structure. The wire-like Si grows along the direction. In some cases, Si nanowires sheathed by a silica layer can be extensive as the growth direction remains (See Figures 9 A, B and C). The diameter of the Si core is ~60 nm while the thickness of the silica sheath is ~20 nm.

Silica wires can also be made to form a variety of unique three-dimensional structures. The nanofibers grow into bundles while paralleling a structure that has cylindrical symmetry. These arrays clearly demonstrate the

versatility of the silica nanostructures which can be synthesized into specific shapes, like a “Chinese lantern” - a structure composed of Si and SiO₄ where an SiO_x tube extends from the top of a silica wire bundle (See *Figure 10*).

The nanostructures demonstrated in this paper are dominant silica forms. Silicon nanocrystals/nanowires are formed in regions that are densely enclosed by the silica nano fibers. The short segment of the Si wire-like structure in *Figure 9A* is a typical example. This suggests that the growth may be dominated by vapor phase infiltration. In the regions dominated by silica, the local porous structure would appear to permit the diffusion of oxygen and silicon atoms through the materials, resulting in the growth of the silica structure. In the regions densely surrounded by silica, the diffusion of oxygen into the structure may be hindered resulting in the accumulation of silicon atoms and the formation of silicon nanostructures.

What is a Plain, Nematic or Reactive Mesogen’s Role as a Bio-Sensor?

Newer developments in nanotechnology are now producing not just nanostructures, but taking these structures as their building materials to make nano tools and machines or functionally smart materials, such as mesogens. The chemicals used to make these types of materials consist of silica, silane, siloxane, acetone, ethanol, polypropylene, toluene, phenol, methylmethacrylate, polyurethane (as waterborne polyurethane), MDI/butane diol, and many others.

The polyurethane under scientific investigation for mesogens is a segmented copolymer with hard segments of MDI/butane diol. The soft segments are polysiloxanes with a cyano-biphenyl mesogen attached to each repeat unit via an eight-methylene spacer. The soft polysiloxane backbone ensures that the liquid crystal is free to move in this low temperature environment. Liquid crystalline mobility is further enhanced by the choice of the long spacer used to decouple the mesogen from the polymer main chain. The structure of this macromolecule, as well as a predicted morphology, is presented in *Figure 1*. The hard segments form hard domains ($T_g = 88^\circ \text{C}$), and the soft continuous domains are in the smectic A phase over the entire liquid crystalline temperature range ($T_g = -4.7^\circ \text{C}$); $T_{\text{clearing}} = 104.2^\circ \text{C}$).

Changes in these structures are dependent upon their nanostructure materials reaction to temperature, pH, halogens, oxygen, and frequency.

Mesogens may be two-dimensional and then 8 layers or more high, just as you would build a high rise apartment complex. The nano term for this is "nematic," as in rising up. A reactive mesogen will react to temperature, pH, halogens, oxygen, and frequency. Frequency is very important because specific frequencies may be used to cause it to react, make it a specific structural morphology, trigger it to react and send an electrical impulse, or monitor its terrain (land, air, sea, or even a human body).

The overall synthetic design of the material is intended to provide a phase segregated morphology such that the pendant liquid crystalline groups in the soft segment would be free to respond to applied fields while anchored by the hard domains. A siloxane backbone may be used in the soft segment because siloxanes are known to be very low glass transition (T_g) materials. For instance, non-substituted hydromethylsiloxanes have T_g values on the order of -110°C . Siloxane oligomers substituted with the cyano-biphenyl mesogens of the type reported in this paper have been shown to have T_g values between -16°C and 25°C , depending on the length of the spacer group.¹⁹

The choice of the cyano-biphenyl mesogen is governed by the well characterized nature of this mesogen; and the cyano group is known to induce pneumatic liquid crystalline behavior. The relative stability of the nematic versus smectic phases is controlled by the length of the alkyl spacer, which favors smectic phases as its length increases. Another advantage of the mesogen is the clear signature that the cyano group affords in infrared spectroscopic characterizations. This identification tag allows the infrared dichroism studies to reveal the orientation of the mesogen on the applications of a stress field.^{20a}

Specimens collected in June 2010 - from Los Angeles, New York City and Saudi Arabia of nematic mesogens from the nasal bulb of 3 separate individuals - showed in analytical testing that they were made out of the same materials and that the nano claw, or hooks, were all composed of "super glue" upon Raman/Micro Fourier Trans Infrared Spectroscopy analysis^{20b} (See *Photomicrograph 3 and Figure 11*).

HUMAN BRAIN CHIP CASE STUDY: From Exposure to Device

In July 2011, *Integrative Health Systems™, LLC* (IHS) received a referral patient for comprehensive industrial toxicology evaluation and advanced biological monitoring testing. During that time, the patient explained how she was exposed to multiple directed energy sources that were monitored within her home. The individual, a female of Chinese ancestry, age 57, a professional cultural educational director/musician, explained that approximately two years prior she was sitting at her desk talking on the phone (right ear) when she experienced a feeling of burning-glass needles entering into her left ear and its canal. Several weeks later, she started to experience pains on the left lobe area of her brain and also experienced a cough that came from the upper bronchi area of the left lung. Testing performed by her physicians revealed - in 2010 and reconfirmed in 2011 - a 9 mm meningioma on the left lobe of the brain. The patient/client was determined to remove the meningioma and to have it tested, so surgery was scheduled at Cedar Sinai Hospital with the surgeon being UCLA's Director of Neurosurgery. The brain specimen was collected by a private investigator retained by the client/patient and the ear canal specimen was transported to *Integrative Health Systems™, LLC* by the client/patient. All appropriate chain of custody procedures were followed.

It should be mentioned that a 1.2 cm meningioma was removed from a larger 9 mm meningioma and was forwarded to *Integrative Health Systems™, LLC* for advanced nanomaterials comparative analysis, as originally seen in the two MRI's.²¹ The results are stated in this paper as in the testing performed; not only on the brain meningioma, but the two ear canal specimens which were washed out of the ear canal on a separate date. All specimens went through the following phases of analysis as stated below:

- Phase I: Photomicrograph of Specimen
- Phase II: Energy Dispersive Spectroscopy/Scanning Electron Microscopy
- Phase III: Raman/Micro Fourier Trans Infrared analysis
(See *Photomicrograph 3 and 4*)

Discussion, Findings and Conclusions of Brain Meningioma Results

Phase III: Raman/Micro FTIR (Fourier Trans Infrared) analysis was performed on the sphere inside and out of the sphere composition (the outside layer and inner core area). In addition, both areas were re-tested for specific locations associated with materials observed on the outside of the sphere, sliced open, and then the inside core. Note that on each EDS analysis there was reddish material thought to be human blood, but no iron was present in the analysis. Iron must be present in blood to be human blood. This specimen could not be cut with a scalpel. A diamond cutter had to be used on the specimen.

The following results and discussion is based upon *Specimen L/N 19666*, Brain Meningioma, collected November 7, 2011 from Cedar Sinai Hospital. This particular section will address the mesogen sphere found within the left lobe of the brain.

Outer Whole Piece Layer, inside (cut), EDS/SEM Analysis: 20.165 % Carbon; 42.257 % Oxygen; 0.650 % Sodium; 0.289 % Magnesium; 0.229 % Silicon; 10.198 % Phosphorus; 0.435 % Chlorine; 25.778 % Calcium. (Note: Pinkish colored piece - with trace of blood on the outside surface - was not blood because no iron was present, which is required for blood.)

Micro FTIR analysis result was hydrolyzed animal protein.

Same specimen, but the purple area which will be called Sample # 3: EDS of purple area contained: carbon, oxygen, sodium, silicon, sulfur, chlorine, potassium, and phosphorous.

Micro FTIR analysis result was outside surface hydroxyapatite, calcium carbonate, and animal protein.

Micro FTIR analysis result for inside surface was animal protein.

The melting point was initially $>300^{\circ}\text{C}$. A more in-depth melting point test was done and its findings are reflected in *Table 1*. The final result being that the material went through multiple stages of change at various temperatures and ended up not melting at $>1100^{\circ}\text{C}$ and morphologically developed into green powdered crystals.

Brain Meningoma Relative Findings

The outer whitish material under Micro FTIR analysis, by utilization of Bio-Rad equipment, was pentacalciumhydroxyphosphate and hydroxylapatite. The outer region was calcium carbonate and animal protein. The animal protein had some additional unique peaks on the chromatograph which may be due to substance amplification with specific charged elements, as in thin film nano technology coatings. (See *Photomicrograph 12*)

The melting point was $>300^{\circ}\text{C}$ with no other discussion in the report, such as if it burned up or remained the same. Note that Human enamel has a melting point of 1268°C . The melting points do not match.

Hydroxyapatite is also known as pentacalcium hydroxyphosphate. In normal biological conditions, it is known as "brain sand" or corpora arenacea which can calcify within the brain - especially within the pineal gland area. These materials are used as fillers to replace amputated bone, or as a coating to promote bone growth into prosthetic implants. This material is very porous in its natural and synthetic forms, which allows other nano composite materials to adhere to it in layers. It is used to stabilize strontium and other trace minerals as it would be used to determine collagen content in bone.

Hydroxyapatite (Hap) is a major inorganic component of human hard tissue, such as bones and teeth, and its content determines their microstructures and physical properties. Artificial Hap shows strong biocompatibility and bioactivity and has found broad applications in tissue engineering for replacing damaged hard tissue. However, the artificial Hap suffers from its intrinsic low mechanical properties. So, to meet mechanical requirements, Hap can be incorporated with stiff mineral phases (mullite, zirconia, and alumina). The performance and long term survival of these biomedical devices are also dependent on the presence of bacteria surrounding the implants. In order to reduce the incidence of implant associated infections, several treatments have been proposed, such as the introduction of silver or fluoride in the Hap. The objective of particular research conducted by the University of Pisa in Pisa, Italy, by B. Cioni, *et al*, is the sintering of composites based on calcium phosphate; mainly, Hap supported zirconia for bone replacement with better microstructural features. In fact, the use of

zirconia can enhance the mechanical properties of bio-ceramics. Moreover, the introduction of small amounts of silver, which should improve the antibacterial properties, has been taken into consideration. Note that silicon was present, which is also found in zirconia complexing agents with metal oxides.

The hydroxyapatite found in this specimen is a biomimetic synthetic material that is used to transfer information and, consequently, to act selectively in the biological environment.

Synthetic biomaterials can be turned biomimetic by imprinting them with the morphology of biogenic materials. Biomimetic hydroxyapatite represents an elective material because it has a very similar composition to the mineral component of bone; and, moreover, its chemical-physical properties and surface reactivity can be managed by modifying synthetic parameters. The morphology of synthetic biomimetic hydroxyapatite is essential to optimize its interaction with biological tissues and to mimic biogenic materials in their functionalities.

Biomineral morphogenesis is related to specific strategies for the long-range chemical construction of well organized architectures from preformed nano or micro crystalline inorganic building blocks. In fact, many biologic complex structures are obtained by promoting specific links induced by the conformation variability at the nanometric scale of the biological macromolecules. Vertebrate bones and teeth are biological hybrid materials where a calcium phosphate, in the form of Hydroxyapatite (HA), represents the inorganic component intimately inter grown with the organic matter prevalently constituted of proteins and polysaccharides. To accomplish this technique, the physical-chemical features should be tailored in synthetic biomimetic HA nanocrystals that are the dimensions, porosity, morphology and surface properties. The surface functionalization of HA nano-crystals with bioactive molecules makes them able to transfer information to, and to act selectively, on the biological environment. This represents a primary challenge in the innovative bone substitute materials into the biosensory applied devices for advanced nano materials.

The presence of calcium carbonate, in addition to hydroxyapatite, suggests that the initial materials which entered the left ear canal were primarily

composed of carbonate-hydroxyapatite nanocrystals (CHA) that have been synthesized with a nearly stoichiometric in bulk Ca/P molar ratio of about 1.6-1.7, containing 4 plus/minus wt % of carbonate ions replacing prevalent phosphate groups. If you look at the EDS results, this range does appear to be the same for Specimen LN 19666^{23, 24, 25} (See Figure 13).

Phase I: Microphotograph of the sphere and cut sphere showed a reactive nematic mesogen (See Photomicrograph 4 and 5). It has been determined that this reactive nematic mesogen may be part of a nano tool/device known as a liquid-crystalline phase development of a mesogen-jacket. The liquid crystalline phase is stimulated by attenuated frequency and pH dispersion. These substances are composed of silicon-stabilized tri-calcium phosphate, both of which were found in EDS analysis. Due to the ratio of calcium to phosphate, it is possible the tri-calcium phosphate molecules were originally present. The decrease in the hydroxyapatite content is proportional to the "drug delivery system" design of this type of material.

Hydroxyapatite is delivered to expand in the mesogen jacketed material via the composition of the metal oxide thin films and other compounds, such as acetylcholinesterase chloride or heprin. Coatings of nano calcium phosphate, as used in biomimetic synthetic materials or MEMS, are for antibiotic purposes. With the presence of strontium silicon or zirconium compounds, there will be a depreciation of biological Vitamin D within human subjects due to strontium inhibiting the metabolites of Vitamin D (OH, 1,25).

Brain Meningoma Conclusions

In advanced biological monitoring tests performed on patient/client, there were elevated strontium, arsenic, nickel, and acetylcholinesterase as well as depleted Vitamin D. To deliver the synthetic calcium hydroxyapatite nano crystals, as utilized in a mesogen jacketed process of delivery, there would have to be the presence of acetylcholinesterase chloride (as in nano tube composition) and/or heprin. The patient/client did have elevated values of 16,005 IU acetylcholinesterase, RBC with occupational levels of nickel and metabolites of styrene as found in polyurethane epoxies or polymers.

In many of the designs of this type of biomaterial, there may be a DNA tag or sensor utilizing a polyamide or polyurethane. These types of materials are utilized to monitor DNA as a biosensor and/or show crystal growth behavior to utilize a one-dimensional copper core with a nickel shell. Nickel was found at high levels within patient/client's blood.

If the materials are being utilized for monitoring Nano/Info/Bio-Tech through the monitoring of brain functions, then the material may be registered under studies being conducted by the AMPTIAC sponsored information analysis center of the US Department of Defense (DOD). Some of these types of brain or CNS bio-sensory research applications have been granted to *US Nanocorp, Inc., University of Connecticut, Lifeboat Foundation, Dr. David E. Reisner, Rice University*, and its applications for nanodielectric materials for high energy density capacitors. Under US Military applications, there have been projects that deal with specific tasks of textiles, biosensors, and fluidic lab-on a chip MEMS under small business developmental grants for the *US Army, US Air Force* and (1991-1995) by the *Naval Air Warfare Center* in China Lake, CA.^{27, 28, 29, 30}

The material found to compose the reactive nematic mesogen with mesogen jacketed calcium hydroxyapatite nano crystal scaffolding is a synthetic man-made material. It is used to monitor the brain, CNS, and other biological activities of the body. Current analysis and patent information appear to show that this is made in the USA, with possible investment aspects in manufacturing or intellectual technology bridges into Hong Kong, China, Korea and Japan.³¹ Additional confirmation will be revealed after obtaining the Micro FTIR results of the ear canal calcification specimen, which will be addressed in a separate section of this paper. These materials may also be composed of terahertz photonic crystals that have a calcium carbonate and an organic polymer mesogen epoxy, such as of a urethane base.

Ear Canal Specimen Findings, Results and Conclusions

The two ear canal specimens are identified as *19655 Sample A* and *19655 Sample B*. Phase I – Microphotographs, Phase II - EDS/SEM analysis, and Phase III - Raman/Micro FTIR analysis were performed on each of the specimens. In addition, a microorganism analysis was performed on the

water used to wash out the materials from the ear, by the patient/client's physician. Specimens were collected by the patient/client and hand delivered to *Integrative Health Systems, LLC* for advanced nano material analysis and specific collaborative research auspices (See *Photomicrograph 5*).

Ear Canal EDS/SEM Results (See *Figure 14*)

19655 Sample A - 56.654% Carbon; 38.591% Oxygen; 0.023% Silicon; 1.447% Sulfur; 0.670% Chloride; 0.970% Potassium; and 1.645% Calcium.

19655 Sample B - 56.847% Carbon; 41.614% Oxygen; 0.668% Sulfur; 0.163% Chloride; 0.267% Potassium; and 0.440% Calcium.

19655 Sample B Fiber - 52.046% Carbon; 46.158% Oxygen; 1.335% Sulfur; 0.061% Chlorine; 0.113% Potassium; and 0.287% Calcium.

Ear Canal RAMAN/Micro FTIR Results (See *Figures 15 and 16*)

19655/1B (large particle) - Specific band assignments for protein bands are "animal protein". A detailed discussion will address the types of animal protein, which is not human protein.

3300 cm-1	NH stretch
3080 cm-1	CNH overtone
3000-2850 cm-1	CH stretch
1650 cm-1	C=O
1535 cm-1	CNH
1396 cm-1	CH rock
1493 cm-1	CH ₃
1240 cm-1	CNH
730 cm-1	NH wag

19655/2A - Black Square particles featured small hydroxyl OH group.

19655/2A - Black square particle (Raman) compared to synthetic graphite standard (Alfa Aesar) green laser gave a comparison analysis match to graphite.

19655/2B (Body) - matched to Moon Glycerine U.S.P. (x0.90) (See Figure 17).

19655/2B (Body) - and *Marvanol DP* (See Figure 18).

Additional laboratory Bio-Rad analysis results and observation comments were the following:

- The sample *19655/2A* black square particles did not produce a response using FTIR. It was analyzed using dispersive Raman spectroscopy with a 532 nm laser, and determined to be highly consistent with graphite.
- The sample *19655/2B* body mass was determined to be a mixture of two compounds. One was highly consistent with glycerine; the other, a surfactant *Marvanol DP*. This portion of the spectrum is consistent with a long chain amide polymer.

DISCUSSION OF THE ADVANCED NANO MATERIAL ARCHITECTURE DESIGN

Advanced nano materials have specific architectural design as they are formulated - via their specific chemical composition - with a starting functional number of 50 atoms. This is important to note because the actual design of the specific nano material is then incorporated into a layered film, glue-composite, rod, wire, and other functional nano building blocks to create the specific thin film type, mesogen (layered 6 to 8 stories high when expanded) and specific nano devices. All these materials are man-made.

The delivery system of these materials may be through aerial dispersion - as in smart dust and smart crystal motes - while other materials may not only need pH and halogens to react with the biological system they are found within, but frequency as well. The types of materials utilized in the chemical

compounds to make the nano device into a liquid crystal, crystal mote, nanobot, and many other functional mechanical devices - that are specifically designed to integrate into the biological terrain - will always have a specific "smart function" behind their design.

The visual appearance of specimens through photomicrographs allows the observer to note specific design shapes, sub-parts, and other architectural design features. This is very important because one advanced nano material may very well be made up of multiple parts, chemicals, and the utilization of materials within the biological system to be used to form the device.

In the patient/client's case, she was sitting at her desk talking on the telephone with the phone receiver on her right ear. Approximately two years ago, she experienced a sharp burning glass-needle pain in her left ear that traveled down the ear canal. After that event, she experienced headaches and other symptoms related to fluctuations of high/low amounts of acetylcholinesterase enzyme activity. In 2010, the meningioma was observed on her left brain lobe by the *University of Michigan* at Ann Arbor. It was removed in 2011 by the Director of Neurosurgery at UCLA. The specimen was collected and sent to *Integrative Health Systems™, LLC*, Dr. Hildegard Staninger™, RIET-1, for specific Advanced Nano Material research analysis. The result was a reactive nematic mesogen, which is a nano material device with specific design and function. Due to its chemical composition, it was determined to be a brain bio-sensor and/or related device.

The delivery system for this material was an injection into the ear canal. In many cases, an individual may be exposed to nano materials on separate occasions. This may be true in the patient/client's case, since she experienced a specific type of descriptive pain, which is continually the same for exposure to advanced nano materials "burning glass-needle." This particular experience can be addressed as a "nano needle delivery system" since the standard neurological response for exposure to nano needles is a feeling of a burning glass-needle on the surface of the skin.

She did notice a movement in the bushes outside of her office window. To create a sound stream or laser pulse, one would use a hand held sound,

microwave, or pulse laser to accomplish this task. The wave would have to penetrate through glass.

These facts are important since the material found in the Raman and Micro FTIR analysis of the two ear canal specimens were never exposed to any surfactants or ear wash solution except for water during the ear wash procedure performed by her physician.

The materials isolated in the ear canal pieces, as well as the ear "wax" specimen B, have very unique compositions that are composed of compounds utilized in the making of advanced nano materials.

The patient/client's clinical biological monitoring tests had specific parameters present in high amounts, which are relative to the nano material compositions. The materials found were arsenic, nickel, and acetylcholinesterase. The mesogen from the brain contained hydroxypatite, which is very important for the types of protein bandwidths identified in Raman/Micro FTIR analysis results of the ear canal specimens. It must be remembered at all times that we are not dealing with a specific whole compound, but rather a composite of multiple compounds that comprise ultra thin films, wires, rods, etc. to make a functional nano or bio-nano material.

The Raman analysis of the black square particles showed no signal, which then determined the material to be graphite. When a Raman signal shows absolutely no signal, there can be the presence of "nickel." The nickel has a specific function of creating steam reforming of glycerol into hydrogen when done over nano-size, nickel-based, hydrotacite-like catalysts. Hydrotacite is also called hydrocarbonate where carbonates are present in the EDS/SEM analysis of both *Sample A and B 19655 Ear Canal Specimens*.

In the nickel nano particle process, steam (sweating) or evaporation from the ear canal or from steam reforming (SR) of glycerol for the production of hydrogen over the nano-sized Ni-based catalyst occurs. The Ni-based catalyst was prepared by solid phase crystallization and impregnation methods, as characterized by the analysis results in this paper. The Ni could have contained a Ni/gamma-Al₂O₃ catalyst which would show a higher conversion and H₂ selectivity. When the catalyst is utilized, it would slowly

deactivate due to the carbon formation (graphite) on the surface of the catalyst and then inserting it. In studies by E. Hur and DJ Moon in 2011, it was found that the nickel based hydrotalcite-like catalyst (spc-Ni/MgAl) showed higher catalytic activity to prevent carbon formation than Ni/gamma-Al₂O₃ catalyst in the SR of glycerol.

The tissue within the ear canal has a pH of 4.8 to 5.5 (acidic). Acid-basic materials are often used to catalyze organic reactions. Hydroxyapatite is acidic and hydrotalcite presents basic properties. The association of both compounds in a single material should present a rather unique catalytic a behavior. Studies conducted by Rivera, Fetter and Bosch in 2008²⁵ showed that when they made preparations of hydroxyapatite impregnated with hydrotalcite (hydrocarbonate) and exposed it to microwave irradiation at three different preparation levels, the following results occurred:

- A homogeneous distribution of hydrotalcite on hydroxyapatite surface is obtained when hydrotalcite is precipitated over a previously microwave irradiated hydroxyapatite.
- Alternatively, if the hydrotalcite mixture is incorporated to the hydroxyapatite precursor gel and the resulting mixture is microwave irradiated, hydrotalcite is preferentially deposited in the hydroxyapatite interparticle spaces. (*Note: Hydroxyapatite was on the outside core of the mesogen from the brain with a core of animal protein. The gel may be composed of a silica sol-gel formulation by siloxane thin coatings.*)
- When both hydroxyapatite and hydrotalcite solutions are irradiated, mixed, then irradiated again, the composite behaves as the addition of the two components.

In the hard ear sample called 19655 A, there was silicon present. Silicon is a mixture of silica, silicon dioxide, and quartz. The analysis showed carbon results, which can be from silicon carbide (SiC) and other related materials. Grains of silicon carbide (SiC) have been used in the formation extremely refractory and chemically resistant minerals, such as diamond, graphite, silicon carbide, silicon nitride, and various refractory oxides.^{26,27,28}

Silicon carbide (SiC) can be dissolved in HCl/HF/HCL to dissolve silicates, CS₂ extraction of elemental sulfur, light oxidation using Na dichromate, colloidal extraction in ammonia of nanodiamonds, and cleaning of the diamond fraction by treatment with perchloric acid resulting in pure nanodiamond materials.^{29,30,31} These materials are then mixed into sol-gel which are then formed into liquid crystals and nano composites with animal glue. Animal proteins do comprise the processes of glues when dealing with specific composite materials that will spread, anchor, and then form a specific combined material.^{32,33}

The single compositional elements of sulfur, chloride, potassium, and calcium were found throughout both specimens as in association with the identification of glycerol, *Marvanol DP* (surfactant, salt), and an amine polymer. In nano-encapsulation of proteins via self-assembly with lipids and polymers,³³ the natural factor of squalene monooxygenase enzyme will be utilized by these materials. The specific range found on the Micro FTIR bandwidth was 3000-2850, which is for 2-amino benzhydrol template for highly reactive inhibitors utilized in squaline synthesizes of mesogenic biological and polymeric materials for ultra thin film nanotechnology.

Glycerols are lipids and, in a nanoscale device, may be used in self-assembly with branched polymer of polyethyleneimine (PEI) or other amphiphili poly (ethyleneglycol) monooleate derivatives or salts. The compound *Marvonol DP* is such a compound. The created self-assembly nanovehicles can bind to specific proteins in the presence of these nano-objects. The cationic polymer PEI formed mixed nano-objects with the protein. The polymer conformation in the nanovehicle will establish to sensitive dilution, a property that can be essential for the protein release upon administration, such as observed with animal protein and hydroxyapatite. The amphiphile compounds will create small micelles in the absence of a lipid (the glycerols).^{34a}

Further crystallization within a silicon carbide and related minerals can show evidence of nanometric inclusions and mineral association, which contains specific elements of Si, SiO₂, TiO₂, Fe, Ti, Cr, Zr, Ba, Mg, Th, P, S, Pb, Zn, Nb, Al Ca, and Cl.³⁵ These facts are restated due to the elements found on EDS/SEM results and in biological specimens of client. The nano diamond may have specific inclusions that other materials are attached to it so that it may deliver to other areas of the body as it is dispersed throughout its delivery area.

Graphite is used in the formation of nano carbon tubes and other materials, such as Bucky balls. Single layers of graphite were observed by Raman Spectroscopy and Scanning Transmission Electron Microscopy, within the ear canal specimen, as black square particles. *Manchester University* researchers in 2004^{34b} pulled out graphene layers from graphite and transferred them onto thin SiO₂ on silicon wafer in a process sometimes called micromechanical cleavage or, simply, the Scotch tape technique. The SiO₂ electrically isolated the graphene and was weakly interacted with the graphene, providing nearly charge-neutral graphene layers. The silicon beneath the SiO₂ could be used as a “back gate” electrode to vary the charge density in the graphene layer over a wide range, which will lead into the quantum Hall effect in graphene.³⁶ More recently, graphene samples prepared on nickel films, as well as on both the silicon face and carbon face of silicon carbide, have shown the anomalous quantum Hall effect directly in electrical measurements.^{36,37,38,39,40} Graphitic layers on the carbon face of silicon carbide show a clear Dirac spectrum in angle-resolved photoemission experiments, and the anomalous quantum Hall effect is observed in cyclotron resonance and tunneling experiments. Even though graphene on nickel and on silicon carbide have both existed in the laboratory for decades, it was graphene mechanically exfoliated on SiO₂ that provided the first proof of the Dirac fermion nature of electrons in graphene.

Other Relative MicroFTIR Bandwidths Animal Proteins

~1650 cm⁻¹: Cyanobacteria, *Calotric* sp. protein sheath, the whole-cell spectra are dominated by the amide I feature at ~ 1650-cm⁻¹. This band is sensitive to the protein’s secondary structure, to ligand interactions, and to its folding characteristics.^{41,42} In chemically purified sheath, the amide I and II bands are weaker and the amid II band has shifted to lower frequencies as a consequence of thermal denaturation due to the preparation. This is true for delivery into other biological terrains of proteins.

~1240 cm⁻¹: Cyanobacteria, *Calotric* sp. nucleic acids corresponding to the asymmetric phosphodiester stretching vibration of the DNA or RNA backbone structure.^{43,44}

~3500-3300 cm⁻¹: Present in all spectra liquid or gaseous water and gaseous CO₂ (at ~2360) are often present. The amount of water and the amount of water vapor in the area is directly constant upon dried specimens.

The frequency bandwidths of the following animal proteins found in the ear canal specimens have a dual role in electronics, polymer-based wide-bandwidth, and other characteristic functions. The specific frequency will be addressed.

~730 cm-1: Material associated with polyethylene-polystyrene gradient polymers and their swelling abilities. Usually accompanied by a half-width of 720-730 cm-1 utilized in tromicrographs and micromachined tunneling accelerometers coupled with silicon for capacitive bulk acoustic wave silicon tracking.⁴⁵

~1493 cm-1: PS spheres of PS colloidal crystals (PS – polystyrene) utilized in quantum wells as related to microhydration of stretching the water molecule via metastable and microparticulate hydrated materials.⁴⁶

~1396 cm-1: Single crystal IR spectroscopy of very strong hydrogen bonds of pectolite.²²

~1535 cm-1: Nano micro resonators made of Ir and porous SiO₂ with Bragg mirrors consisting of alternating the layers for a tunable band pass fiber optic filter as associated with protein secondary structures.⁴⁷

~3080 cm-1: Three-cavity tunable MEMs through IR light Fabry Perot Interferometric principle-optical filter. Specific band width of cloned ca3080 for carbonaceous materials to absorb amplitudes, such as the Samsung SND-3080 in the Samsung Techwin's elite line of IP Security computer generated enabling camera materials.⁴⁸

Ear Canal Specimens Conclusion

The materials identified in the ear canal specimens are composed of advanced nano materials that are designed specifically to deliver a variable payload into directed areas of the biological terrain. In the patient/client's case, this was her brain, upper bronchial area, and other areas of the body. The materials are designed to form under specific frequency releases into working mechanical devices that may tunnel into the tissue or specific areas of the body.⁴⁹

The mesogen associated with patient/client's meningioma was composed of materials that were delivered to the area (brain) via the original materials in

the ear canal. Specific frequencies, as identified in Raman and Micro FTIR, have precise chemical components that were found in her body, such as metabolites for styrene, nickel, acetylcholinesterase, and porphyrins.

It is important to realize that many of the specific frequencies identified in the Micro FTIR identified materials are used to allow explicit tracking or biometric equipment to track, monitor, and control or take pictures utilizing the human subject as a walking-talking monitoring device. This process is highly complex and involves many levels of science, medicine, physics, and engineering. In such cases, the materials within the biological specimen will attract specific forms of energy and react. This means that no direct energy wave or emission from an outside device has to be present. It may be done on a computer system, smart phone, satellite, wireless phone tower, or other similar devices.^{50,51,52}

Since the hydroxyapatite is associated with payload delivery systems utilizing microwave, the original activation of her ear canal may have been from a microwave hand-held device or similar. The specific frequency for the materials at $\sim 730 \text{ cm}^{-1}$ bandwidth is for styrene, which is used for tunneling. The patient/client has perceived continual movement and can feel the materials moving. It should be remembered that many of these materials would have a metal or piezoelectric material associated with them to enhance their ability to bind, attach, or anchor to the nervous system as it would establish a micro array pattern or grid. The grid system would be to the core of the individual, i.e. bone.^{53,54,55}

The use of cyanobacteria protein sheaths and DNA/RNA may be utilized as a specific material to set tracking devices to, or to program reactions. This fact is stated because it is very rare that cyanobacteria protein would be found in the human body; and, it was in the nano composite material that made up the ear canal specimen.

It must be emphasized that the Nano Molecular Identification and Nano Architecture of man-made mechanical devices is through a highly skilled approach in order to put all of the morphological characteristic facts together.

The original meningioma mesogenic sphere had further melting point analysis done on it, which is contained in the data of this report. It must be noted that the specimen continued to change in composition with higher

temperature exposure. The final result was that it turned into a green crystalline powder at $>1100^{\circ}\text{C}$. It should further be noted that graphite, a man-made compound, turns green at 1100°C in the presence of nickel.

The materials found in the ear canal specimens could have also been utilized as a sending and receiving device for acoustical transmissions when coupled with specific advanced materials.

CONCLUSIONAL SUMMARY

The integration of nanotechnology into the bio-sensory world to monitor or control human life is where the line in the sand is drawn for the human being. The majority of High-Impact Technologies that utilize brain-computer interfaces as a "Brain Chip" or Bio-Sensor would be for the following:

- Control and monitoring of the brain and bodily functions.
- Control and monitoring of the behavior of the individual.
- Sending and receiving verbal commands.
- Stimulation of bio-electrical transmissions within the neuron trees of the nerves.
- To be utilized as a listening device for remote sensing and monitoring.
- To be used as a transmitter for listening in on conversations within a specific area that the individual may be in where the device has been implanted in them.
- If there is a digital computer component to the device, it could be used to capture visual transmissions as a walking/talking monitoring system (a high-tech extrinsic spying system, especially for industrial/military espionage).
- Many other aspects as related to the multiple use applications of mesogens.

It is our own individual divine right as a human being, created in God's own image by his own hands, to be a HUMAN. A human that has free will as originally designed by the Creator and not to be enslaved by a man-made "Brain Chip" that can be dispersed in the air, shot at you with a microwave, then controlled by your TV, computer, or cell phone. When these materials interface into the Human, they become a Transhuman controlled by another Transhuman - who may have very well been a Human at one time. NOW is the time for all of humanity to realize that enough is enough and no human

was created to be turned into a "POST HUMAN SPECIES." That was never the true divine plan of the universe.

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- www.ieeexplore.ieee.org/iel5/84/32479/01516171.pdf?arnumber=1516171 Polymer-based wide-bandwidth and high-sensitivity micro machined tunneling accelerometer, chemical sensor, infrared (IR) radiation sensor.
- 43) www.ieeexplore.ieee.org/iel5/3/29490/01337030.pdf?arnumber=1337030. Mid-IR Optical Limiter based on Type II Quantum Wells ~ 1493 frequency.
- www.ammin.geoscienceworld.org/content/96/11-12/1856.full Methods to analyze metastable and microparticulate hydrated related to water ~ 1463 frequency.
- 45) www.minsocam.org/msa/ammin/toc/.../Hammer_p569-576_98.pdf Single-crystal IR spectroscopy of very strong hydrogen bonds in pectolite at ~ 1396 cm⁻¹ frequency.

- 46) www.ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5441498 Bragg mirrors consisting of five alternating layers of Ir and porous SiO₂ are designed. ~ 1535 – 1538 frequency.
- 47) www.a1securitycameras.com/Samsung-Techwin-SND-3080.html
www.geo.uscb.edu/faculty/awramik/poubs/!G!SO611.pdf ~3080 cm⁻¹ bandwidths of carbonaceous material varied according to the degree of its in situ characterization.
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Figure 1 - An example of a mesogen in its architectural design concept phase. (FIGURE 1.1 taken from *Vibrational Spectroscopy of Biological and Polymeric Materials* by Vasilis G. Gregoriou and Mark S. Braiman, page 11. CRC Taylor & Francis. Boca Raton, FL ©2006)

Studying the Viscoelastic Behavior of Liquid Crystalline Polyurethanes

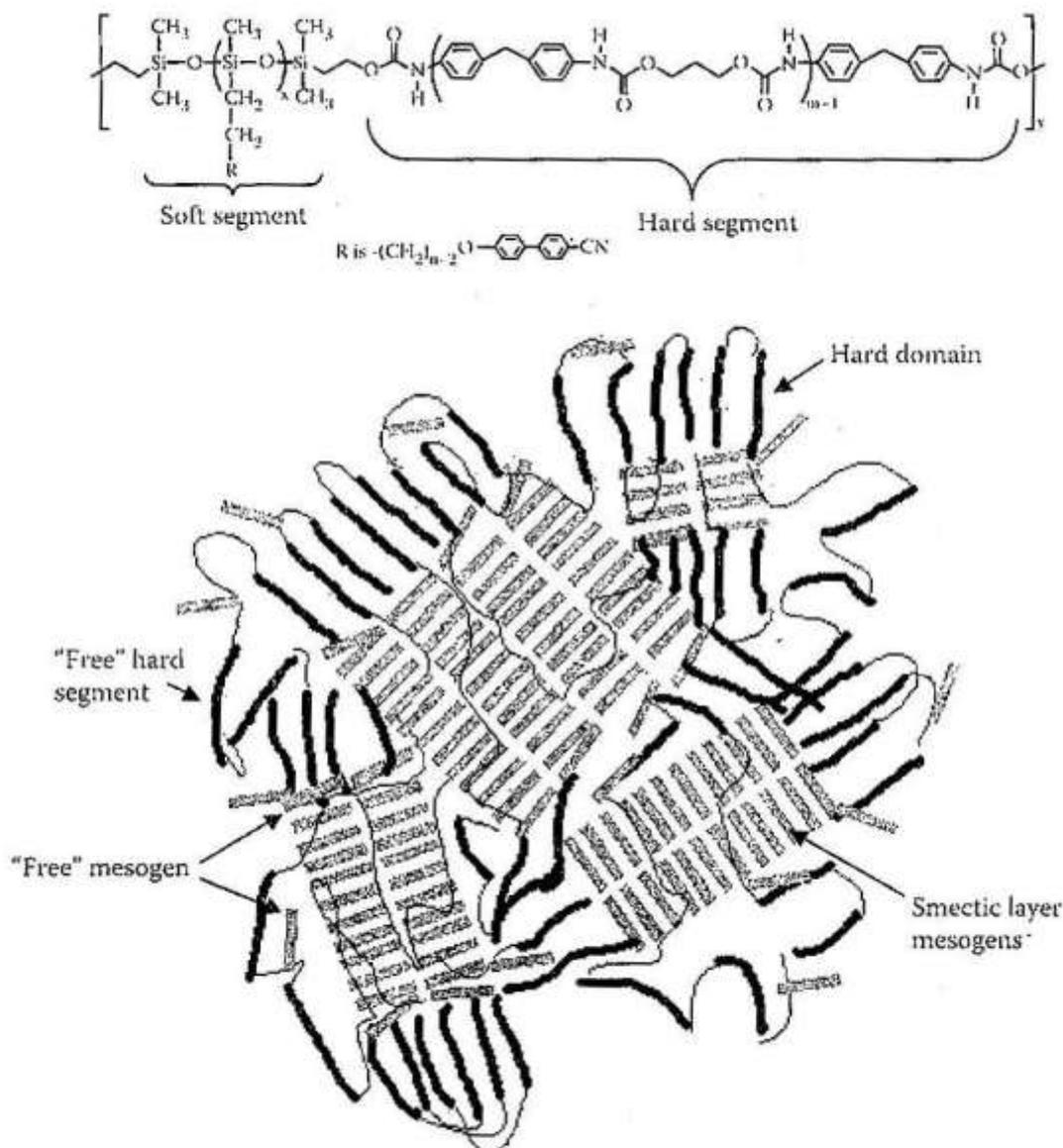


FIGURE 1.1 (a) Chemical structure of side chain liquid crystalline polyurethane. (b) Polyurethane morphology representation. (Reproduced Nair, B. R.; Gregoriou, V. G.; Hammond, P. T. J. *Phys. Chem. B*. 2000, with permission. Copyright [2000], American Chemical Society.)

FIGURE 2 - Acrylate side chain Mesogen

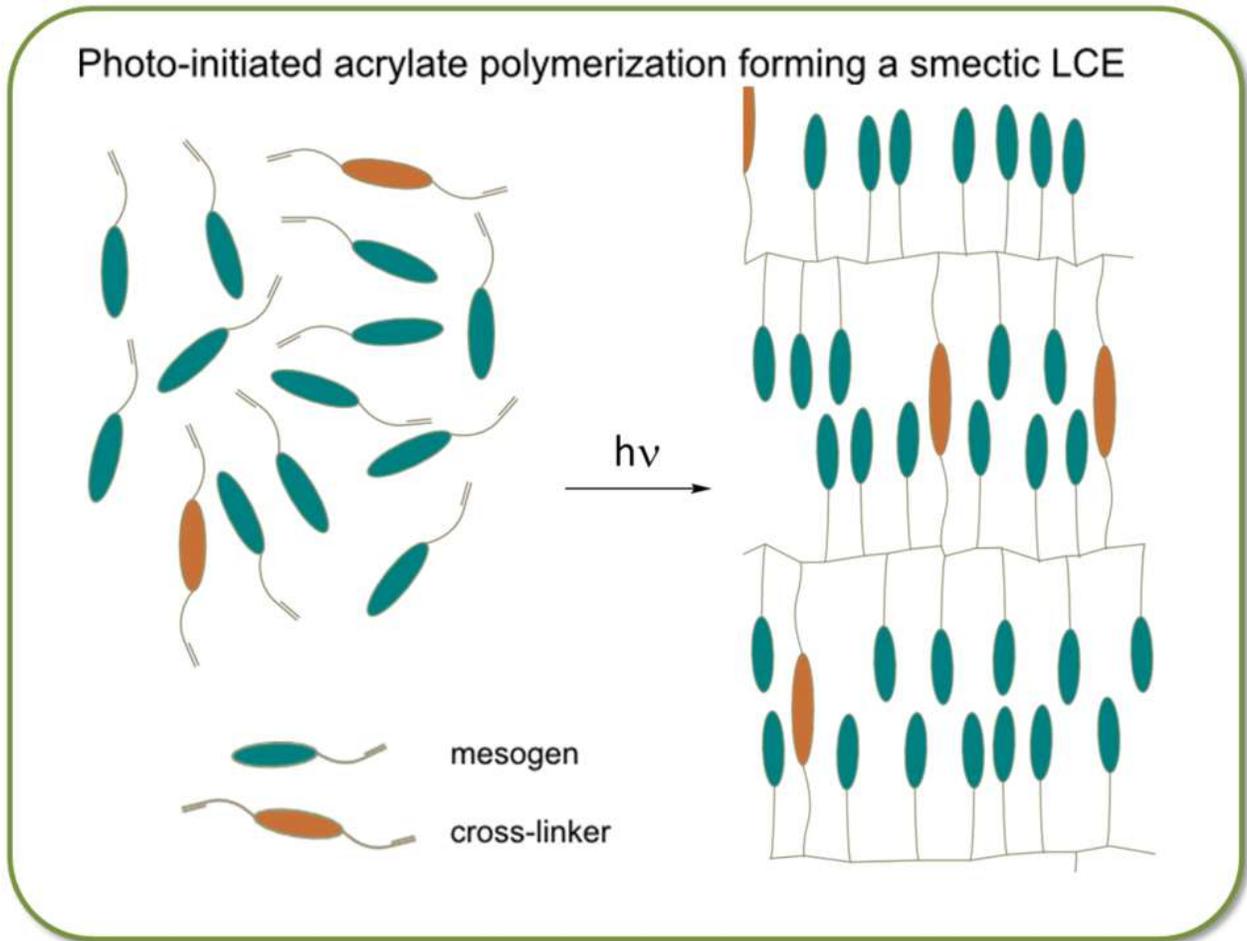


FIGURE 3 - Siloxane side chain Mesogen

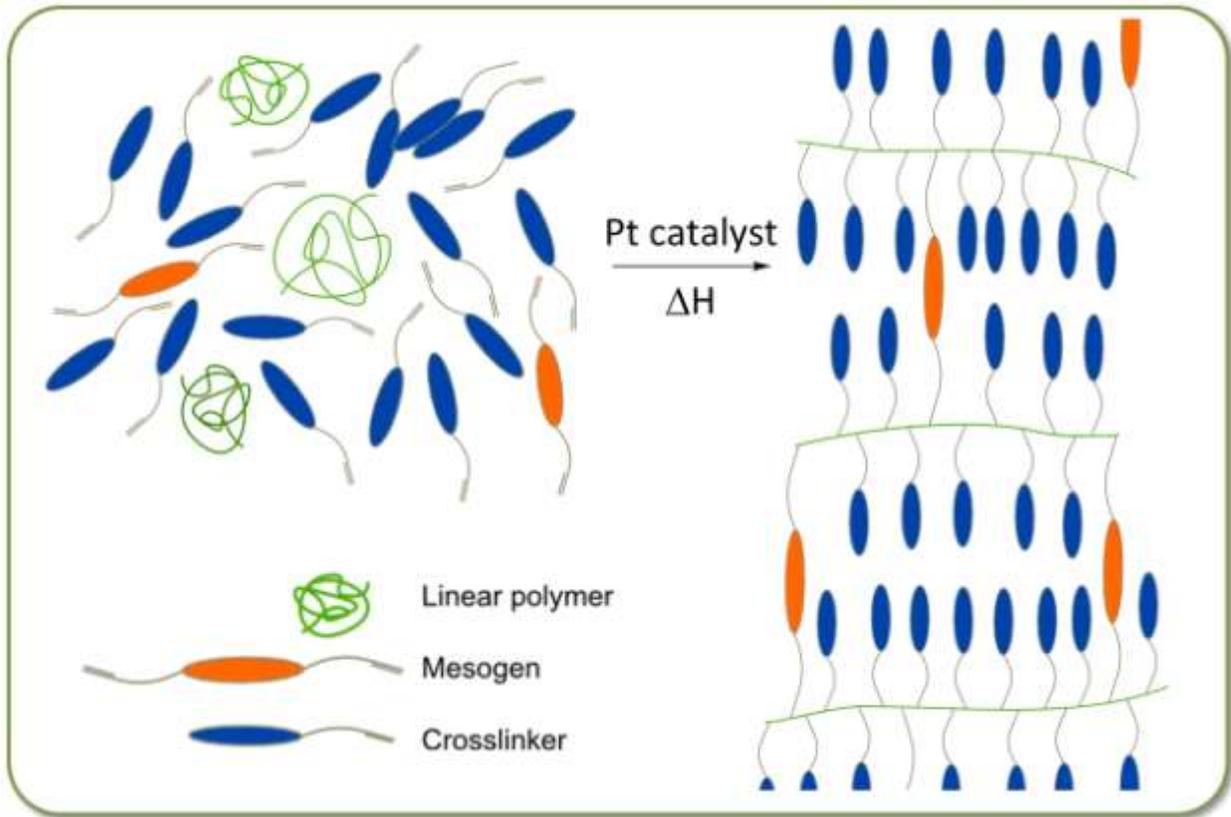


FIGURE 4 - Main chain Liquid Crystal forming Mesogen

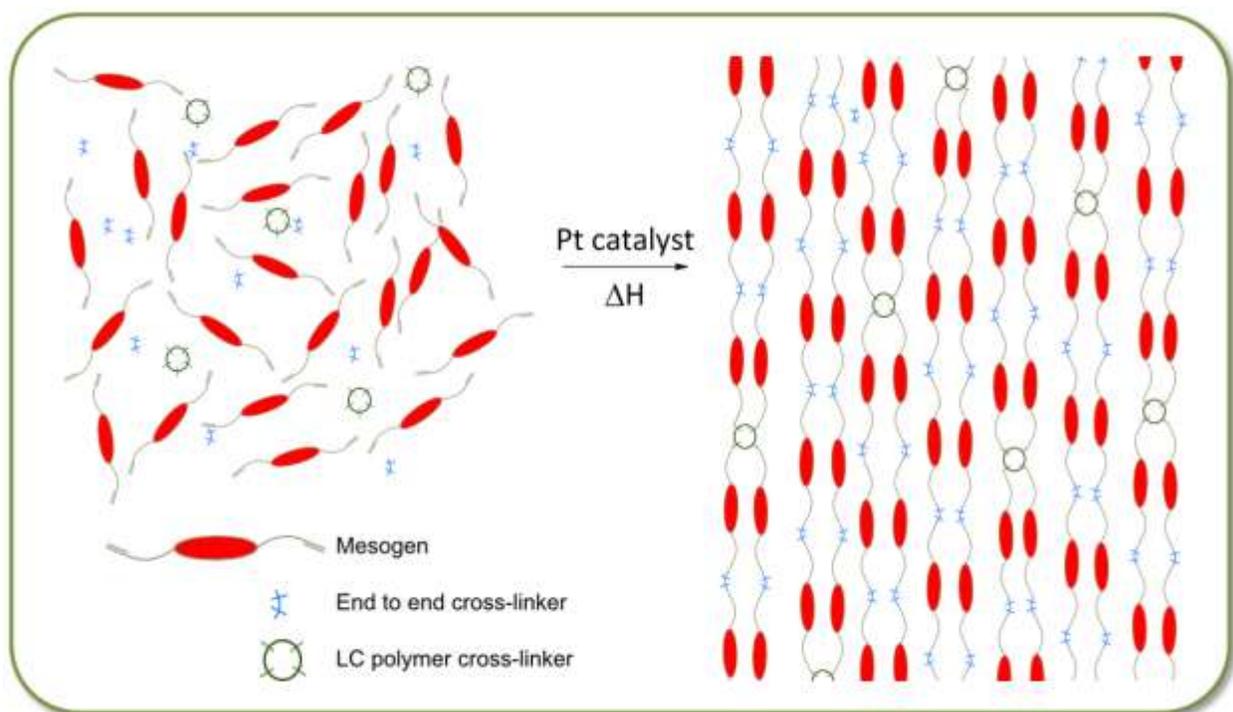


FIGURE 5 - Polyester/polyurethane structural reactions with alcohol

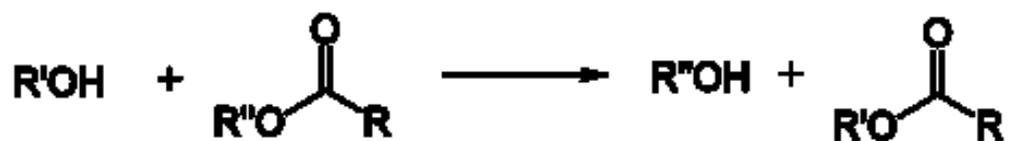


FIGURE 6 A & B - Smetic Phase of Nematic Mesogens

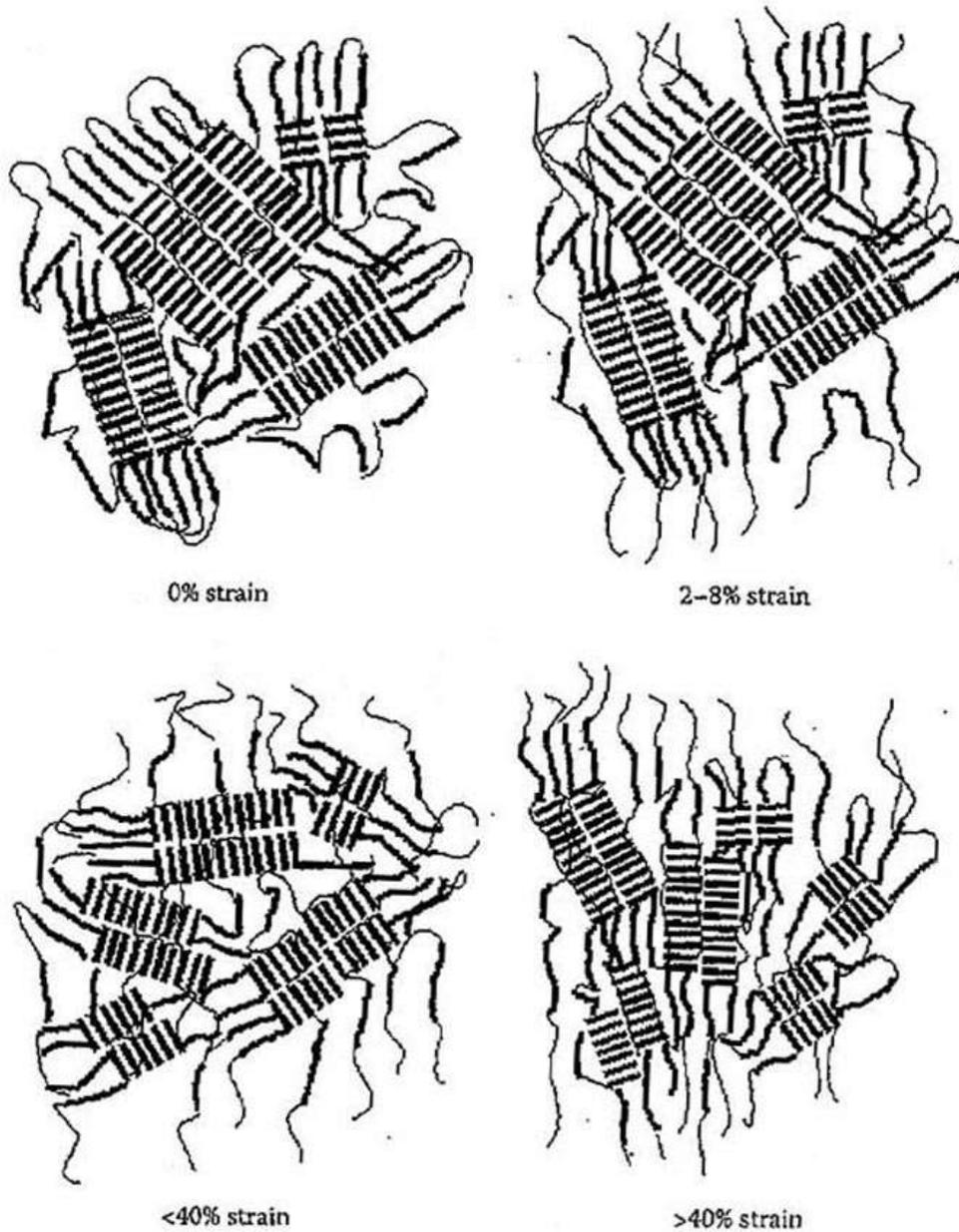


FIGURE 1.18 Proposed model of cooperative deformation of hard segments and smectic layers as a function of strain. (Reproduced from Nair, B. R.; Gregoriou, V. G.; Hammond, P. T. *Polymer* 2000 with permission. Copyright [2000] Elsevier.)

(FIGURE 1.18 taken from [Vibrational Spectroscopy of Biological and Polymeric Materials](#) by Vasilis G. Gregoriou and Mark S. Braiman, Page 31. CRC Taylor & Francis. Boca Raton, FL ©2006)

FIGURE 7 - Chiral Phase of Nematic Phase of Mesogens



**FIGURE 8 - Other Image of Chiral Phase of Nematic Phase of Mesogens
(Note pitch distance)**

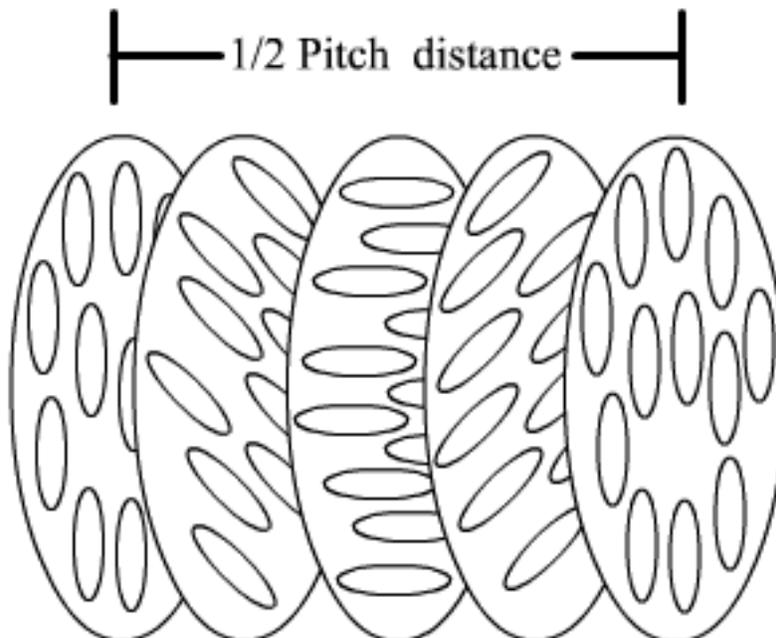
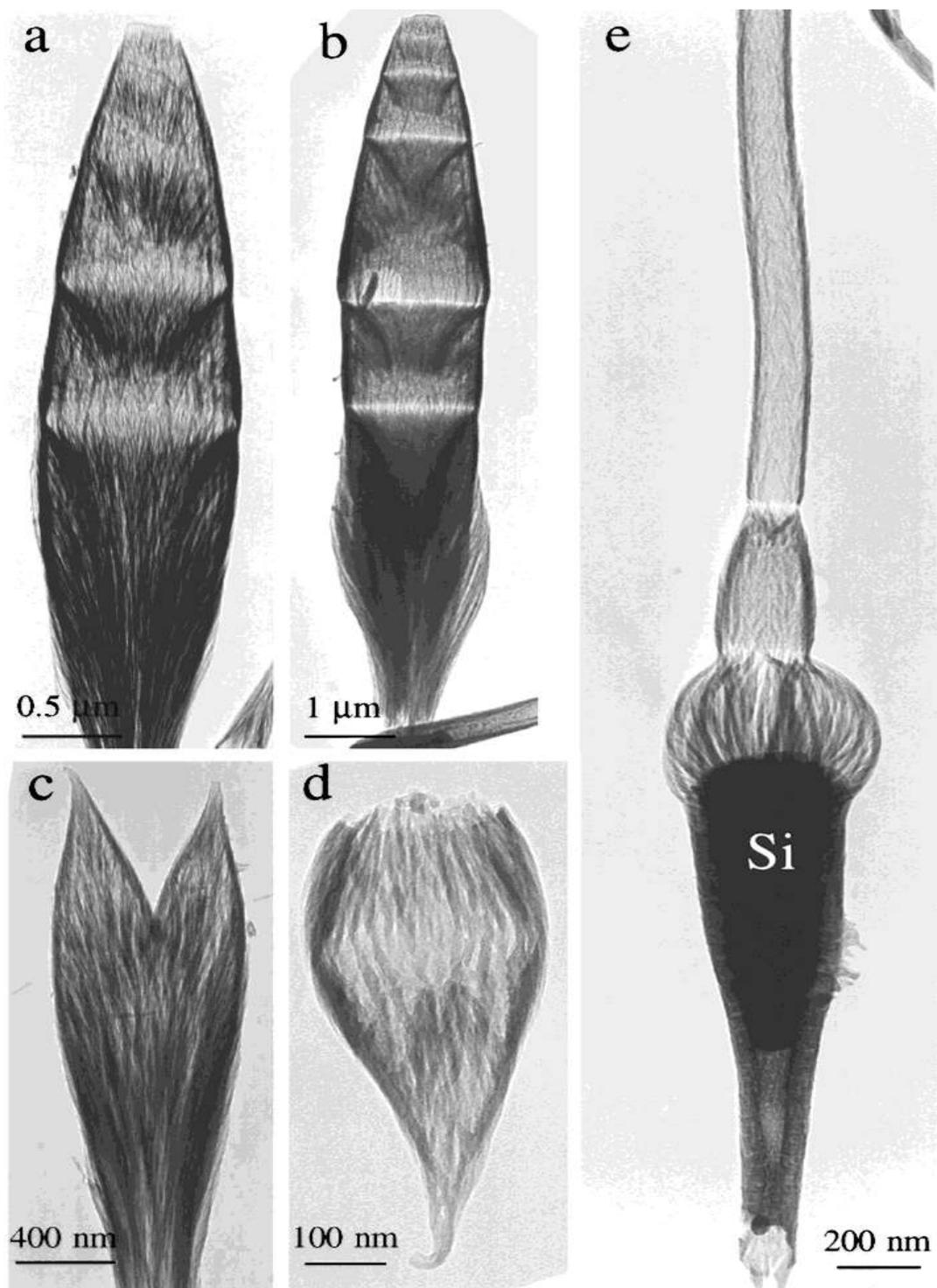


FIGURE 9 - TEM images of silica "bundled" arrays and cages. Taken from the article *Silica Nanotubes and Nanofiber Arrays*, by L. Zhong Wang, *et al*, *Advanced Materials* 200, 12, No. 24, December 15.



TEM images of synthesized silica nano-tube structures usually formed following the trapping of silicon nano-crystals

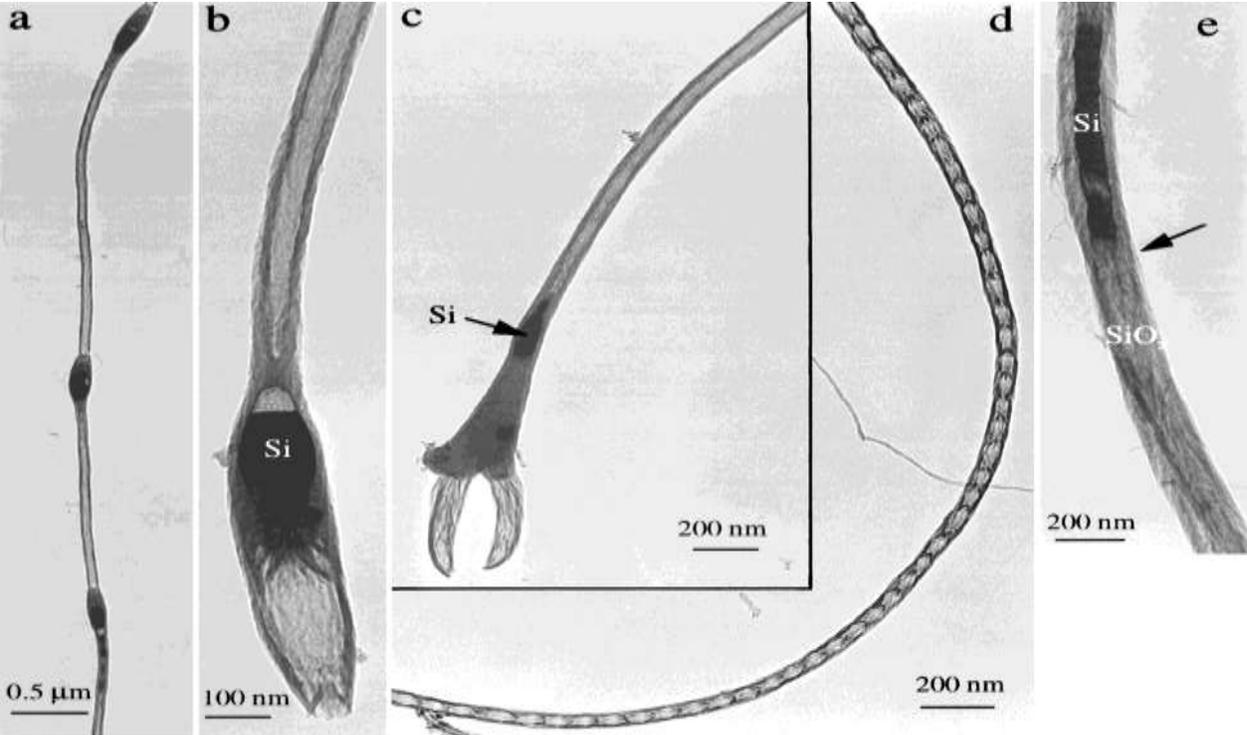


FIGURE 10 - Silica, Silicone and Silicon photomicrographs of "Chinese Lanterns" as taken from skin biopsy specimens. Photomicrograph taken from Project Fiber, Morgellons and Meteorite, ©2006 by Dr. Hildegard Staninger™, Phase I of Project.

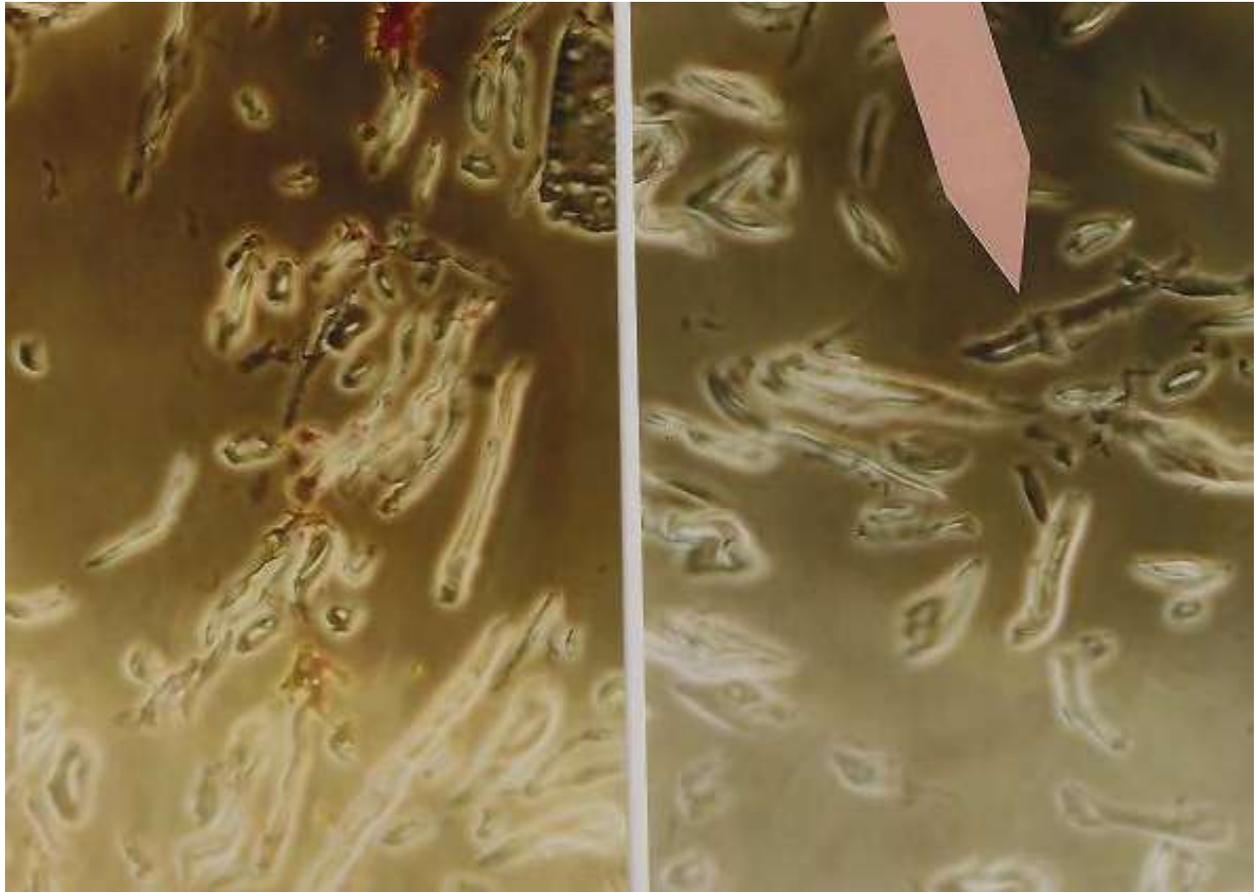
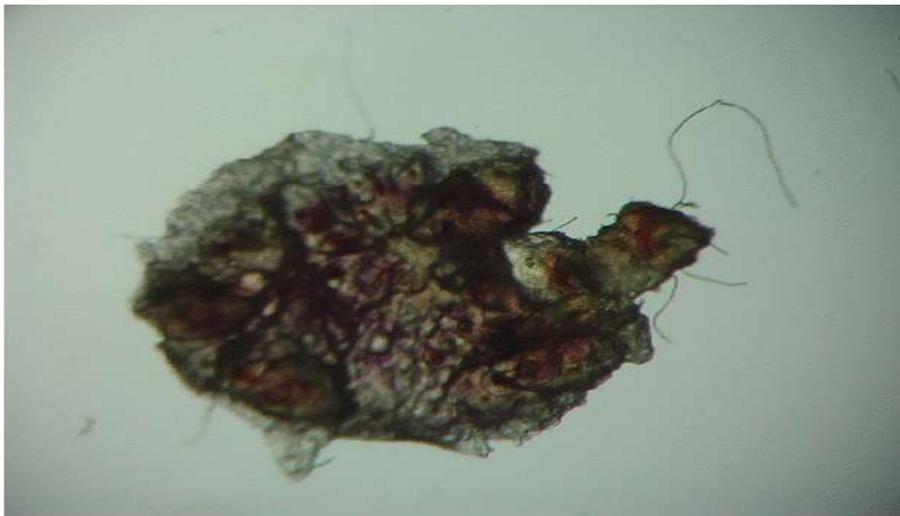
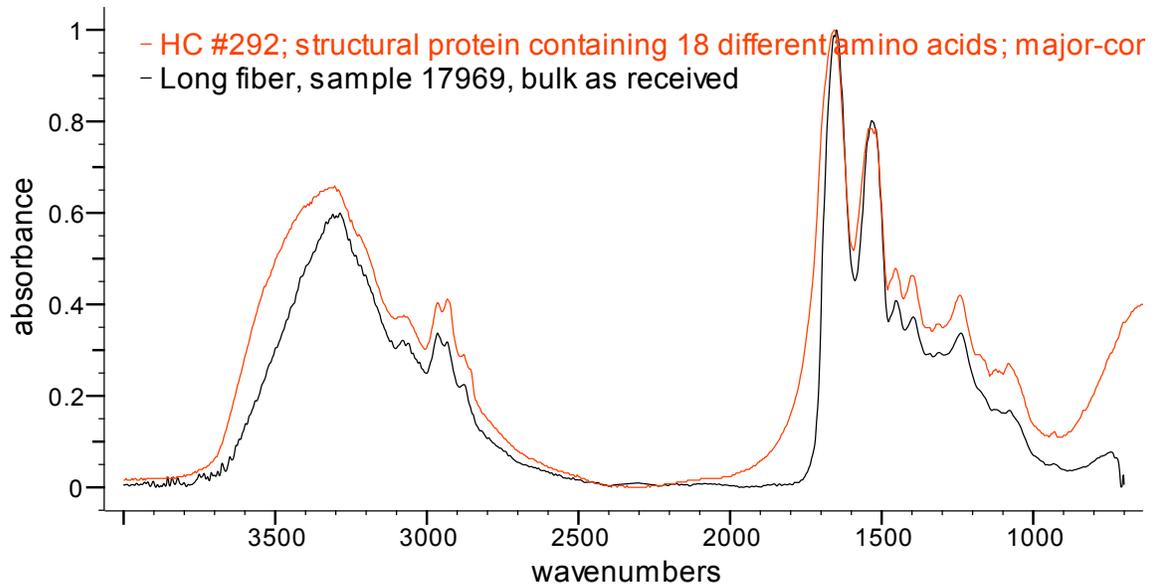


FIGURE 11 - RAMAN/Micro FTIR Chromatograph of nano hooks/claws of nasal bulb mesogens collected from Los Angeles, CA; NYC, New York; and Saudi Arabia in June 2010 for advanced materials testing. Analysis and photomicrographs by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL, for *Integrative Health Systems™, LLC*, Los Angeles, CA.

Los Angeles Specimen

17733





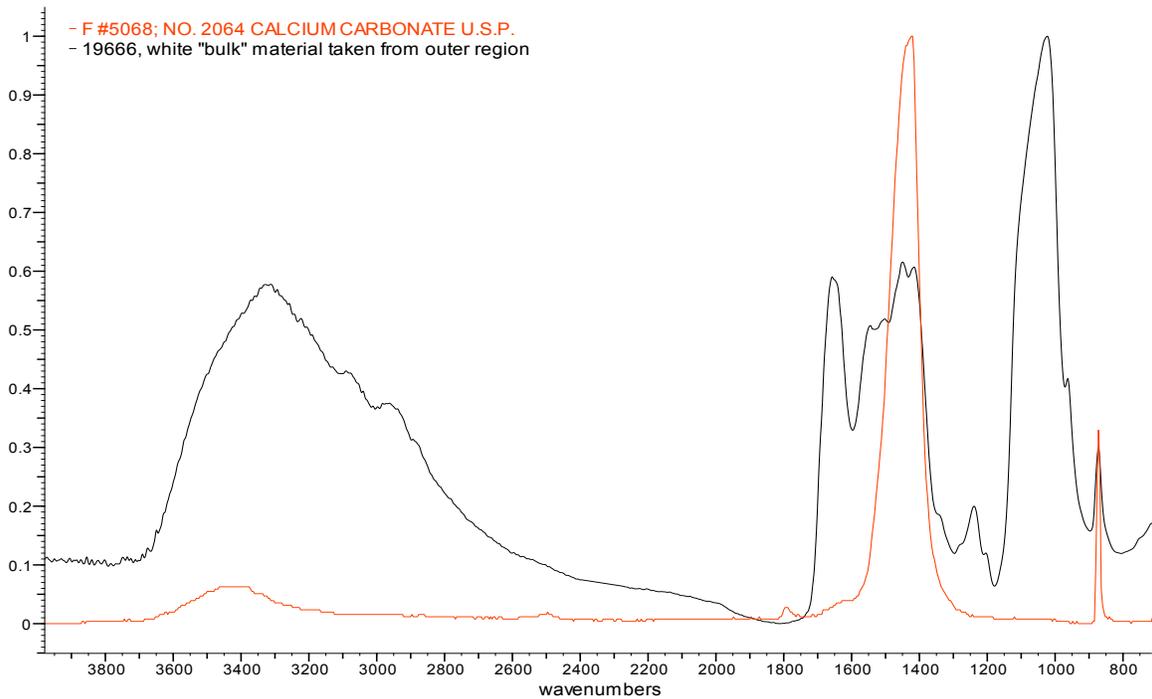
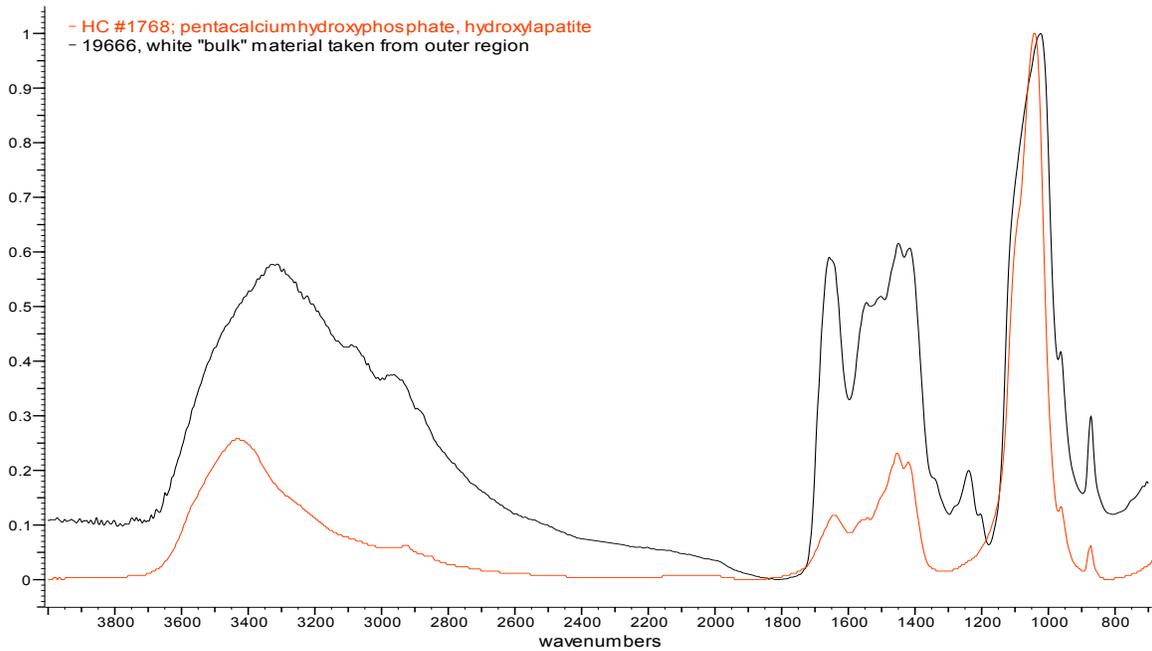
Specific assignments for protein bands

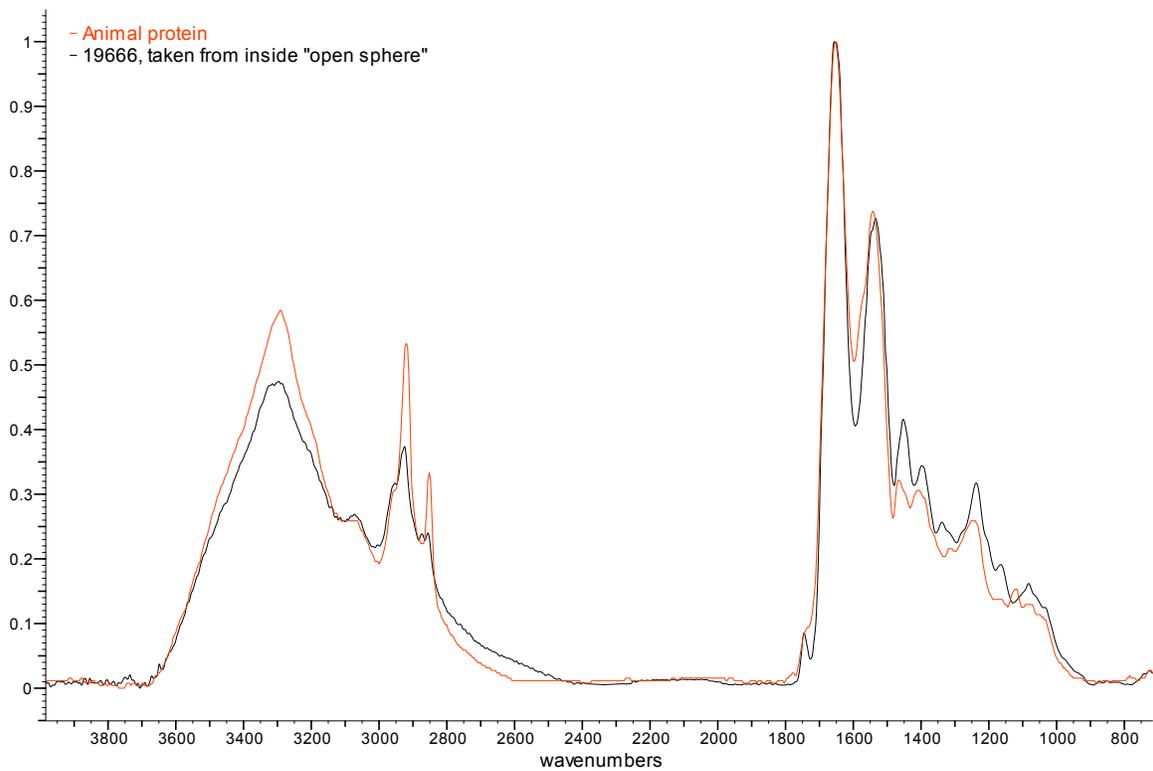
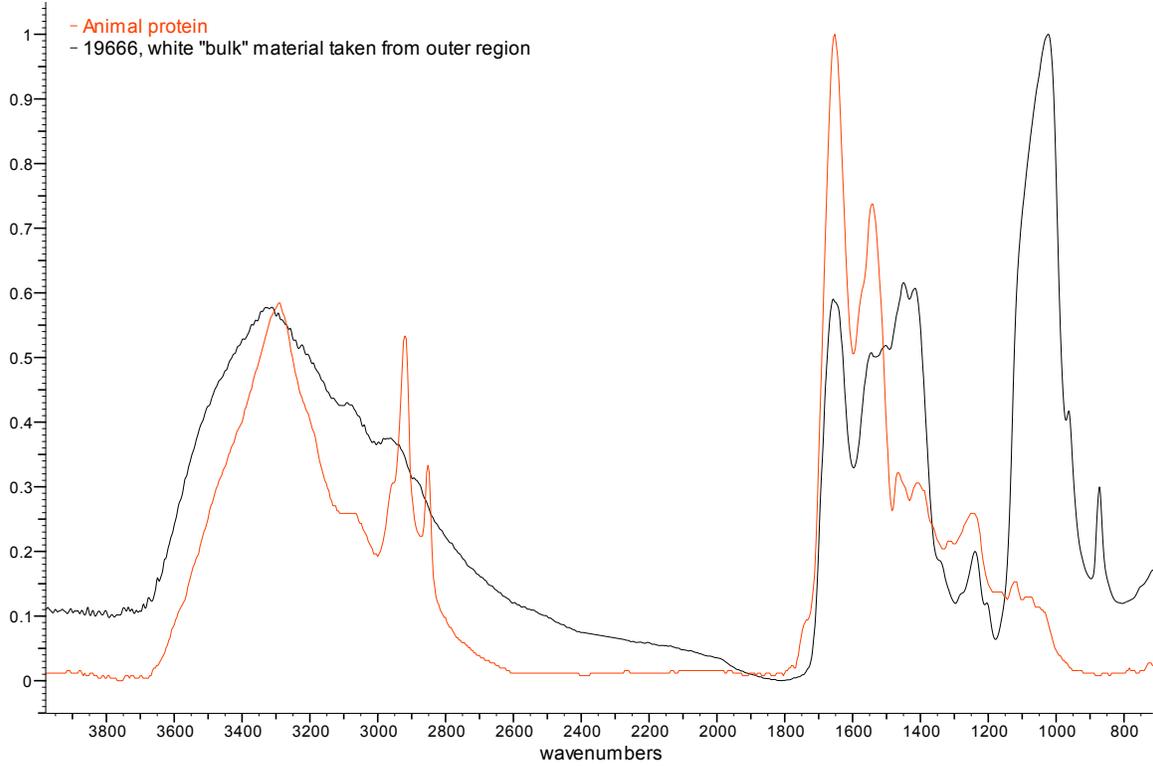
3300 cm ⁻¹	NH stretch
3080 cm ⁻¹	CNH overtone
3000 – 2850 cm ⁻¹	CH stretch
1650 cm ⁻¹	C=O
1535 cm ⁻¹	CNH
1396 cm ⁻¹	CH rock
1493 cm ⁻¹	CH ₃
1240 cm ⁻¹	CNH
730 cm ⁻¹	NH wag

FIGURE 12 - Micro FTIR Analysis result of Brain Meningioma (Mesogen Biosensor). Analysis performed by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL ©2011.

December 6, 2011

L/N 19666

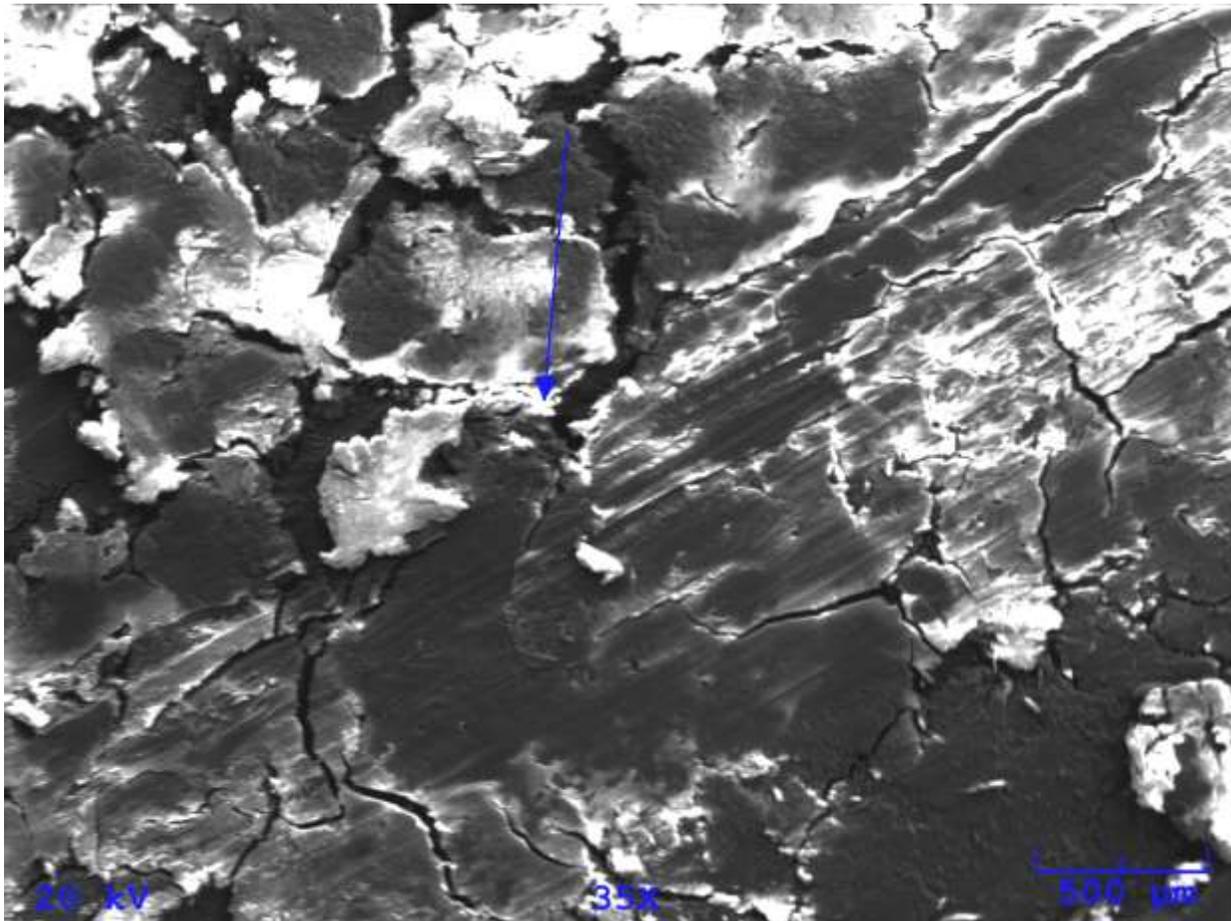




RESULTS AND OBSERVATIONS

- The outside layered skeleton - sample 19666 - was highly consistent with a hydroxyapatite (pentacalcium hydroxyphosphate) with calcium carbonate and animal protein. This mixture suggests that it originated from a deposit such as a kidney stone. Calcium phosphate in the hydroxyapatite form compose bone, teeth, and these calculi deposits.
- The inside "open sphere" portion of sample 19666 was more of red color and consistent with animal protein.

FIGURE 13 - EDS/SEM results of Brain Meningioma – Brain Chip Mesogen Bio Sensor. Analysis performed by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL ©2011



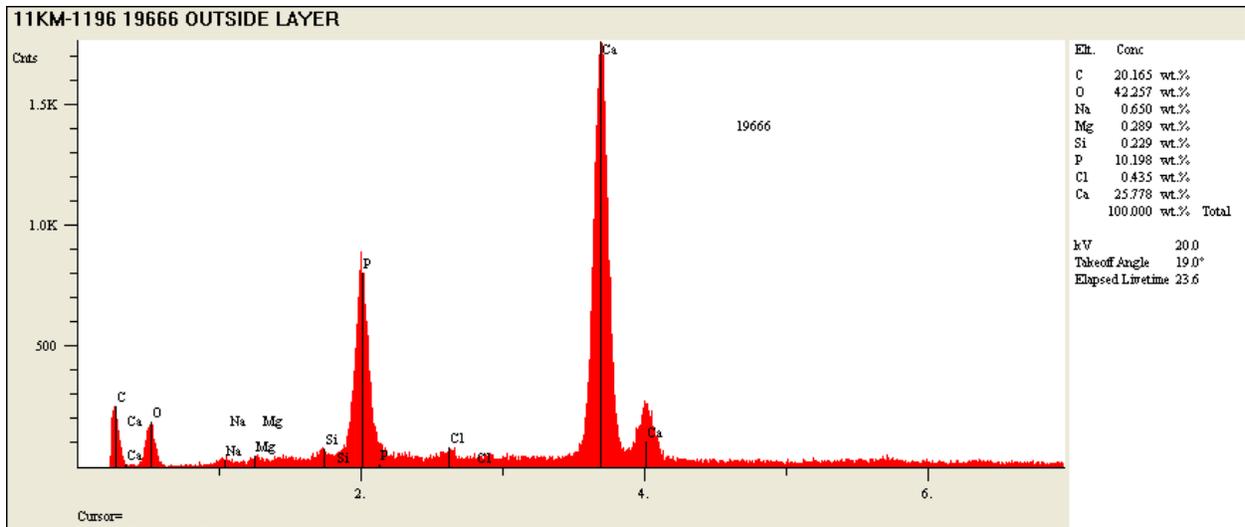
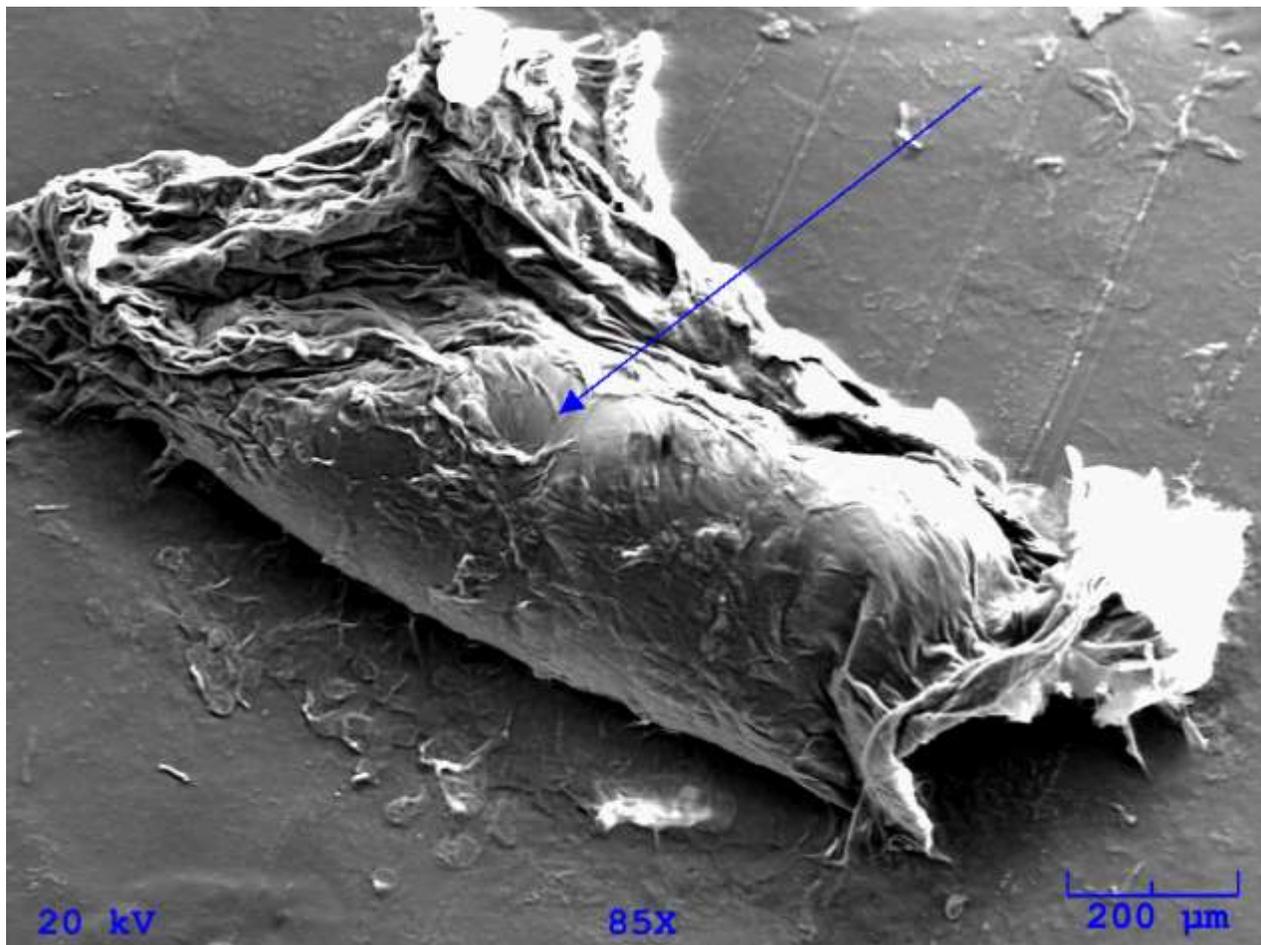
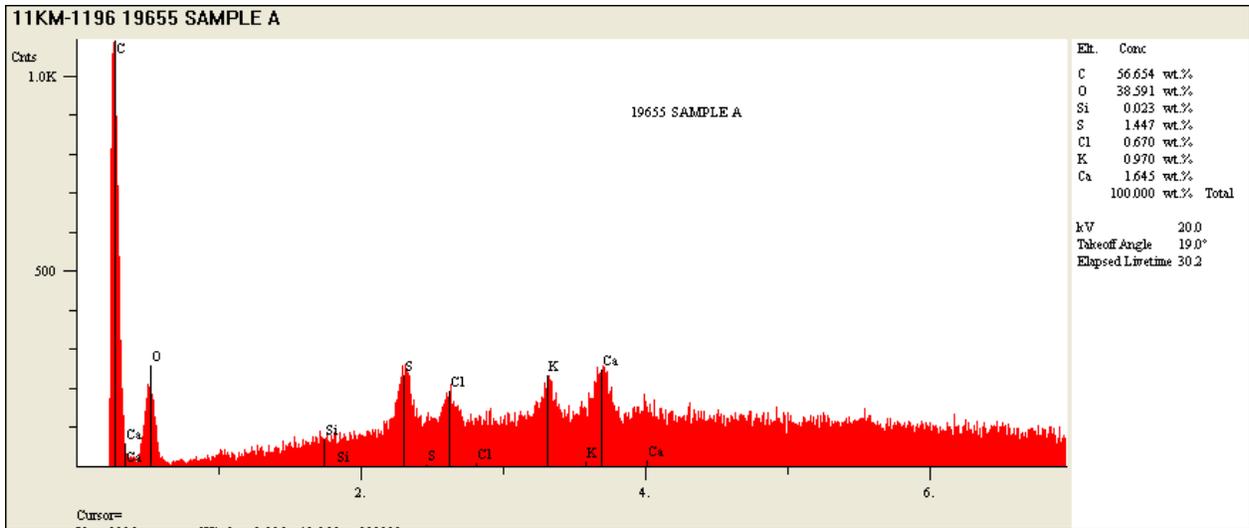


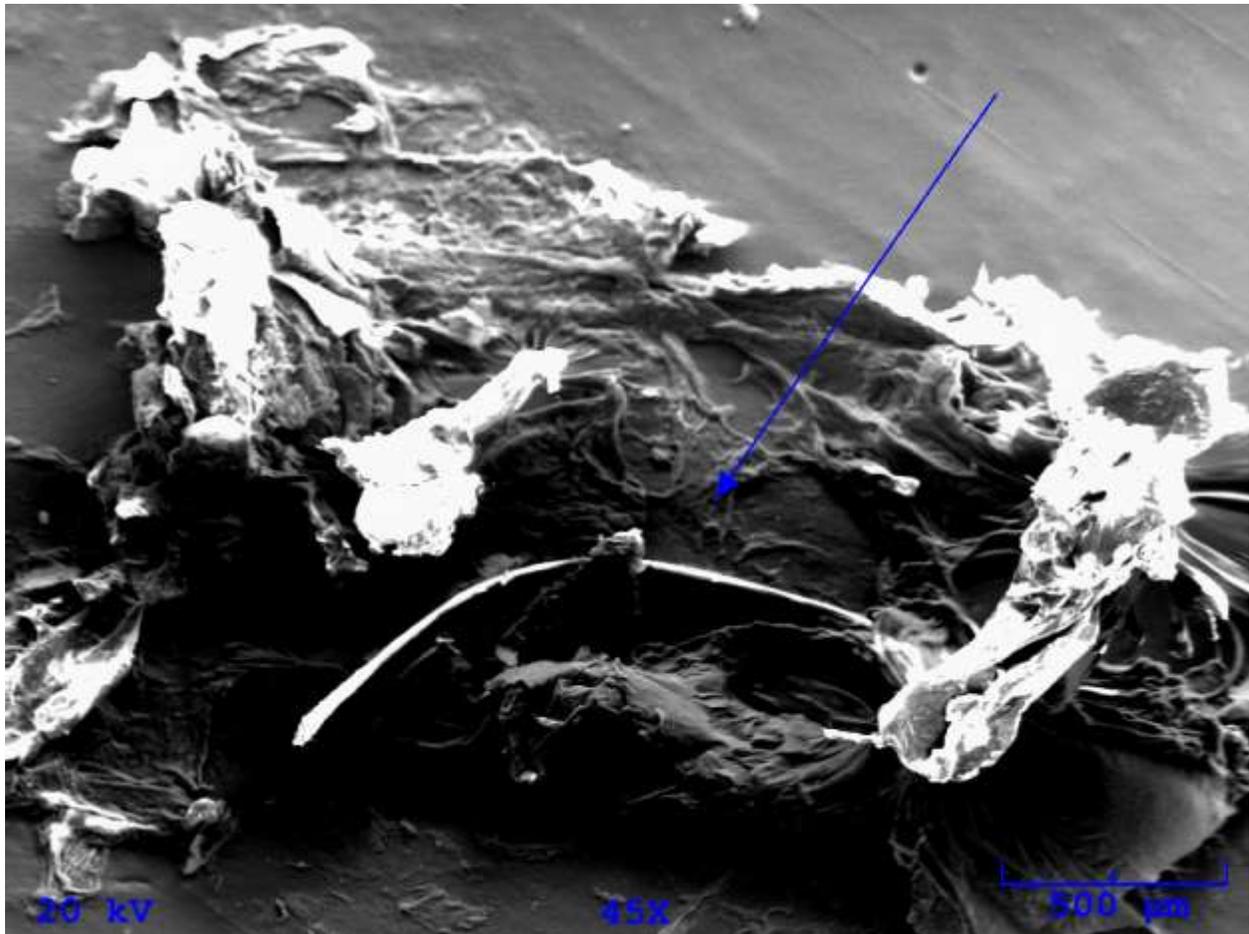
FIGURE 14 - EDS/SEM Results of Ear Canal Specimen. Analysis performed by Applied Consumer Services, Inc., Hialeah Gardens, FL ©2011

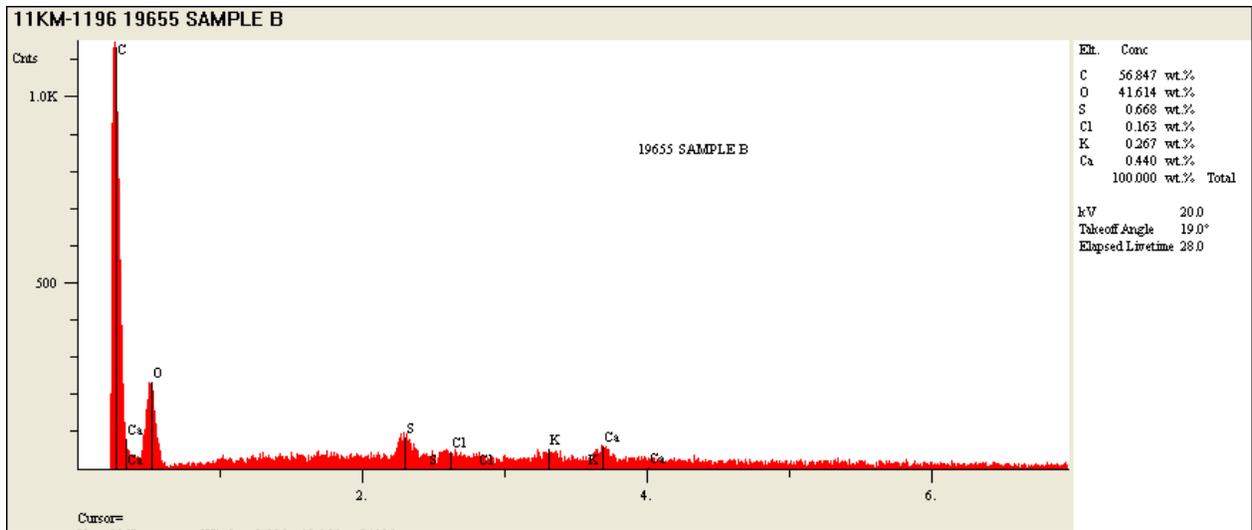
Sample A



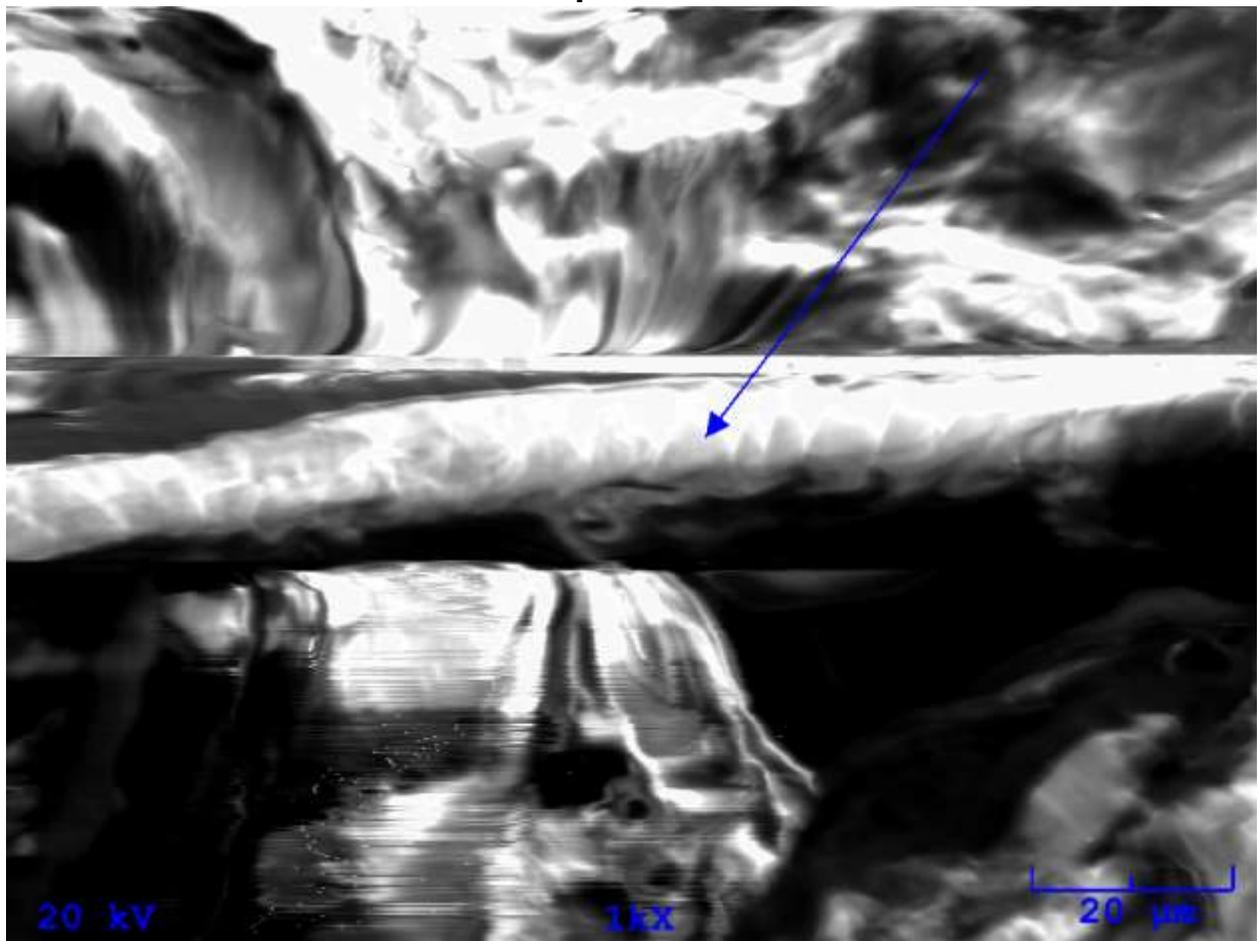


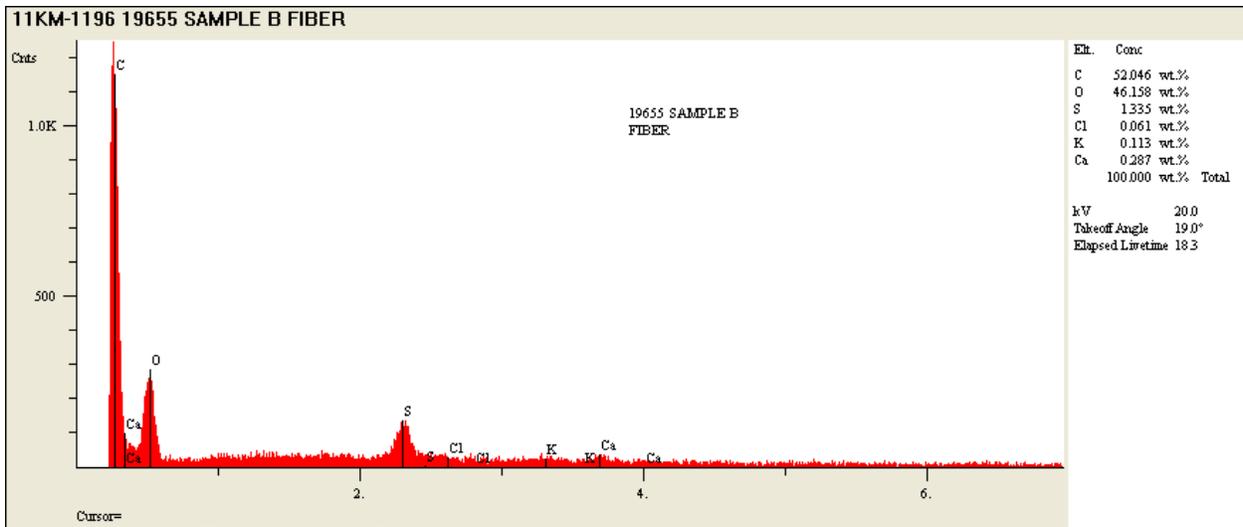
Sample B



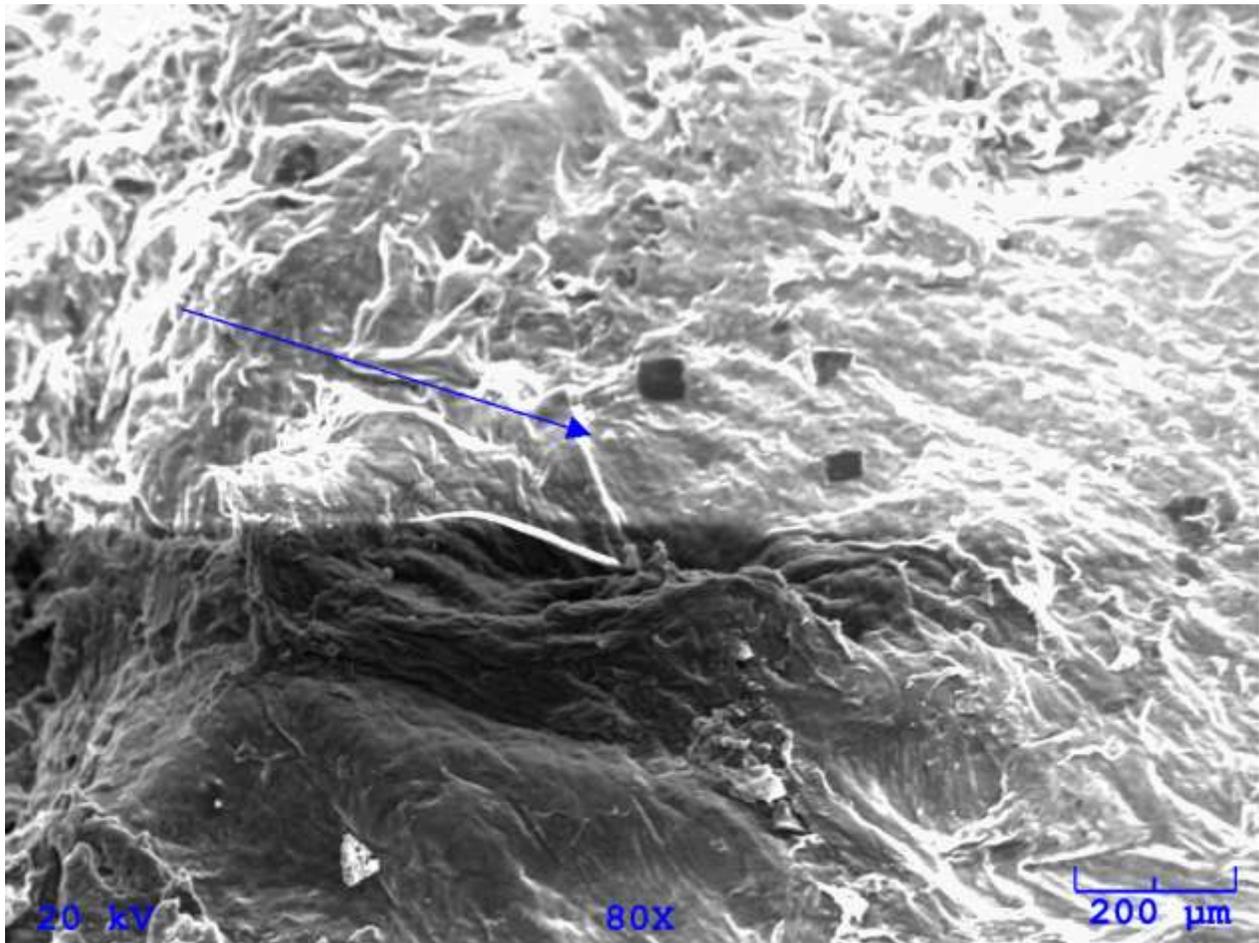


Sample B Fiber





Wax Sample



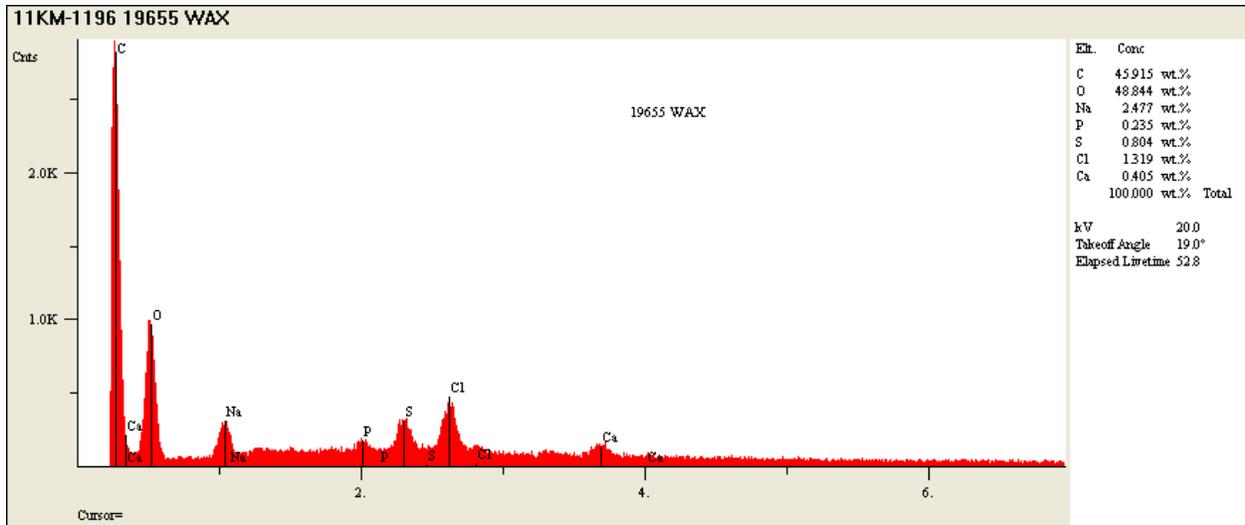
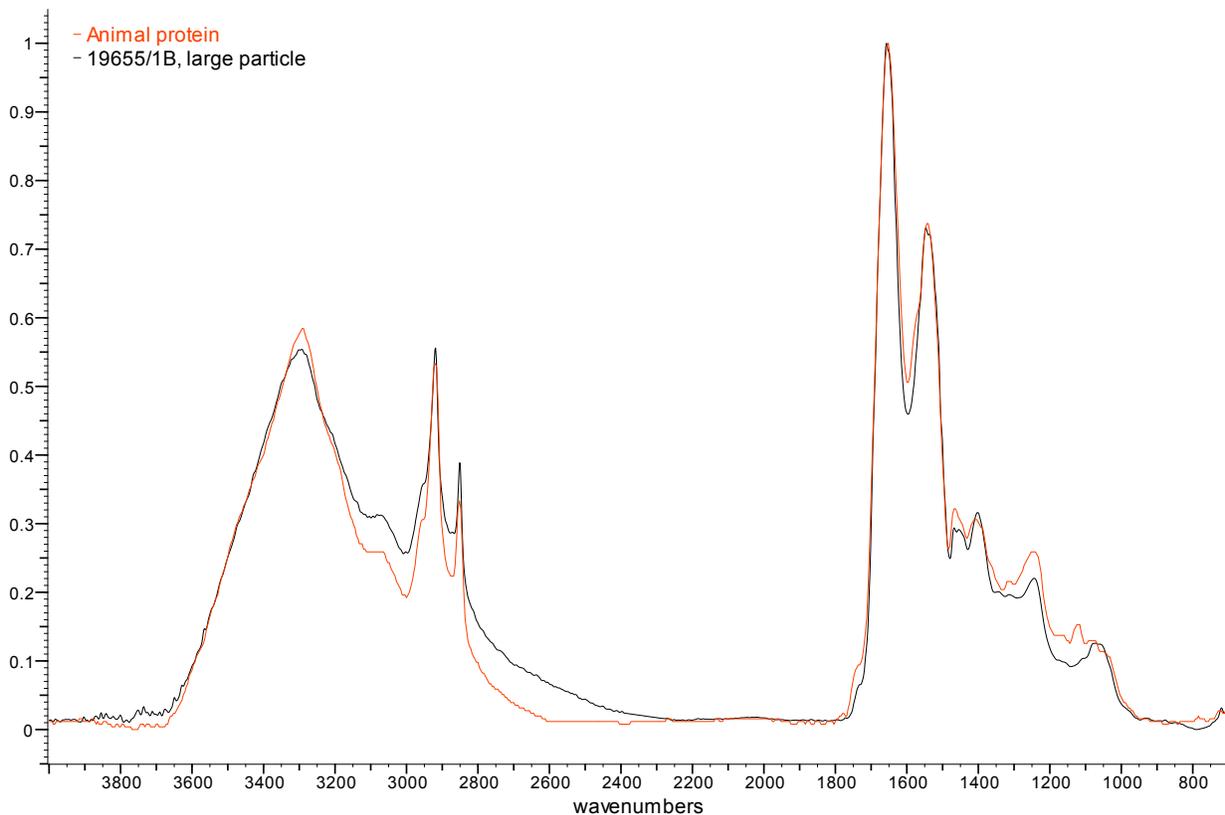


FIGURE 16 - RAMAN/MICRO FTIR Analysis of black square and other compounds from Ear Canal Specimen as a mesogen. Analysis performed by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL ©2011

December 2, 2011 L/N: 19655/1B



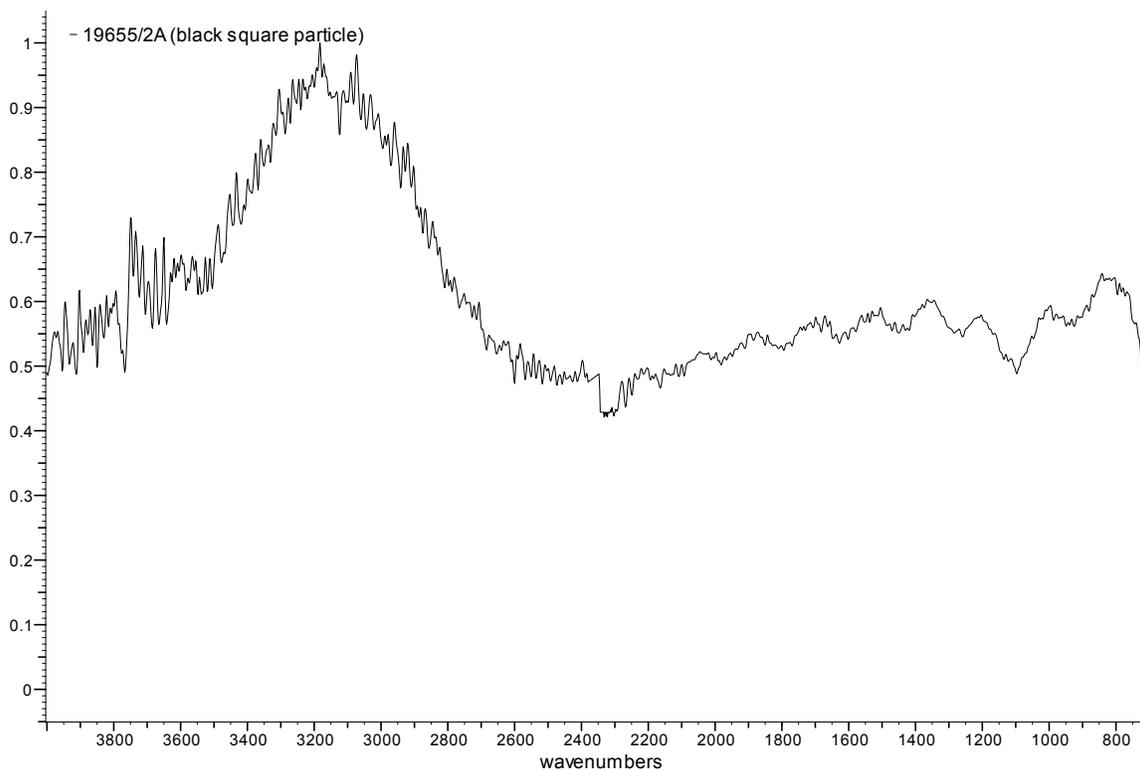
RESULTS AND OBSERVATIONS

Sample 19655/1B was highly consistent with an animal protein. Specific assignments for protein bands are:

3300 cm-1	NH stretch
3080 cm-1	CNH overtone
3000 - 2850 cm-1	CH stretch
1650 cm-1	C=O
1535 cm-1	CNH
1396 cm-1	CH rock
1493 cm-1	CH ₃
1240 cm-1	CNH
730 cm-1	NH wag

December 2, 2011 L/N 19655/2A and 2B

FTIR spectrum – featureless except small hydroxyl OH



Raman spectrum – comparison to graphite

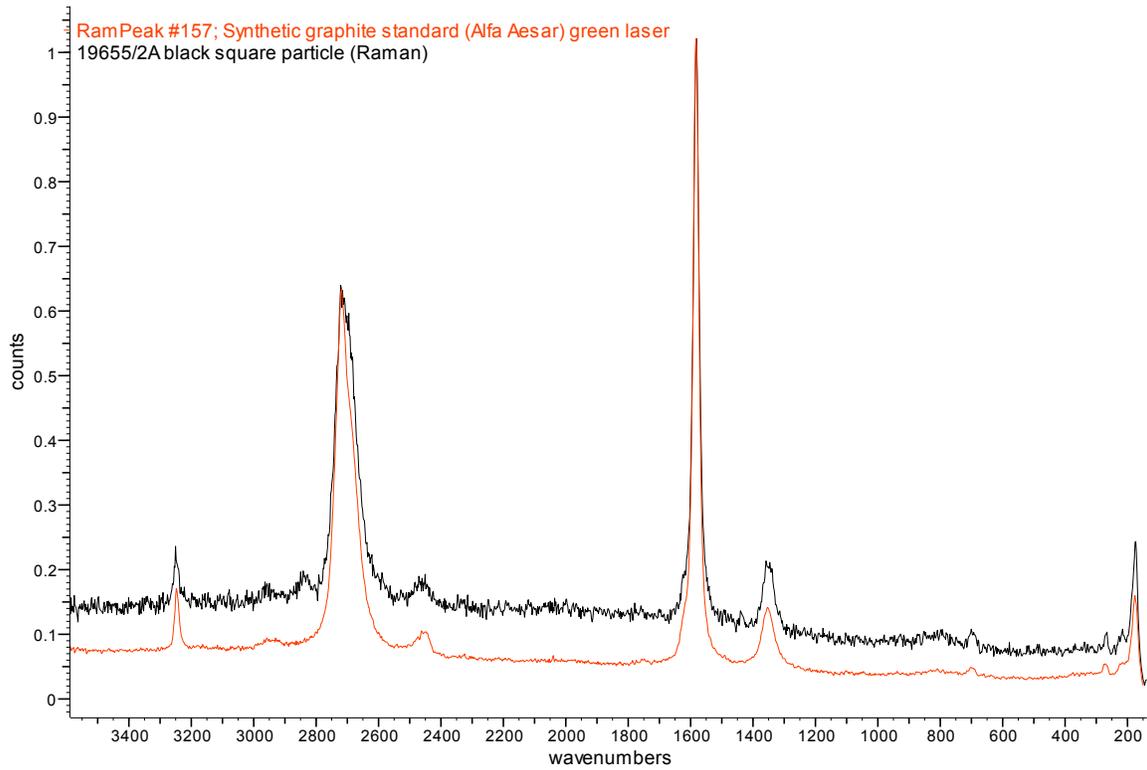


FIGURE 17 - Moon Glycerine U.S.P. Ear Canal Specimen. Micro FTIR (BioRad). Analysis performed by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL ©2011

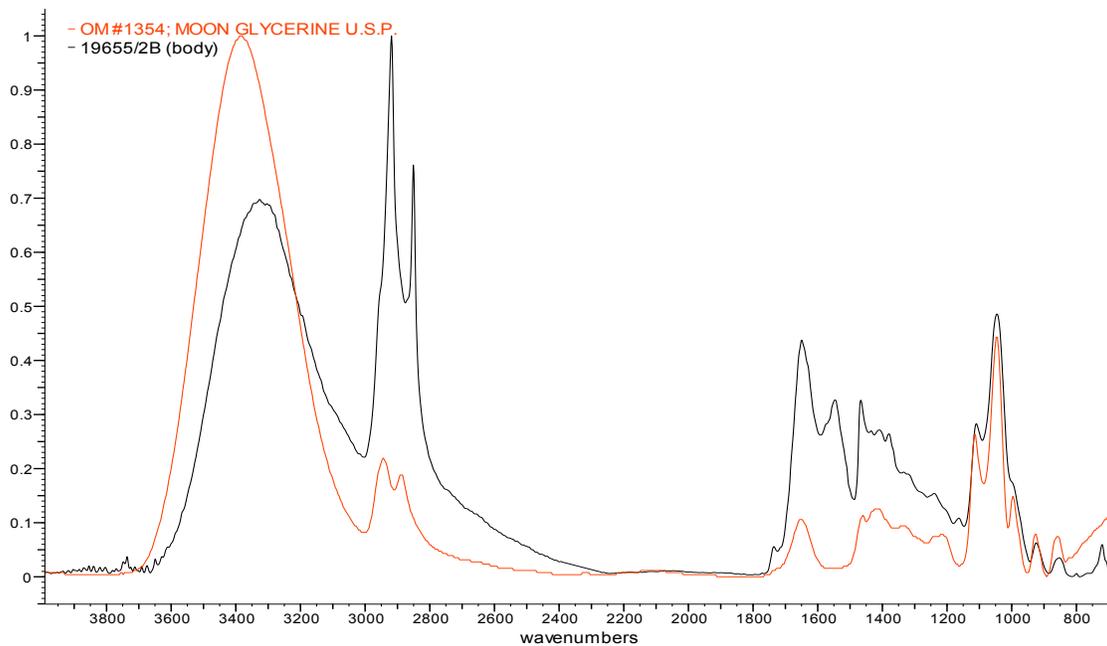
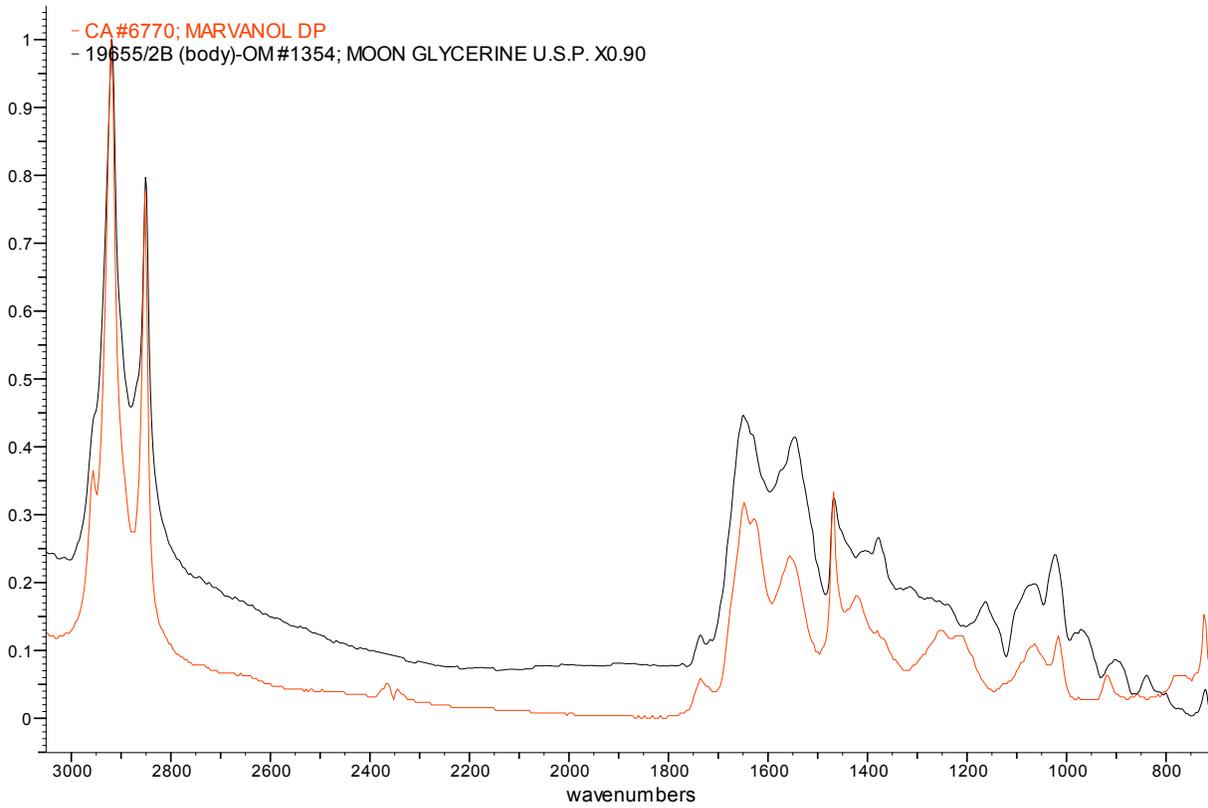


FIGURE 18 - Micro FTIR analysis of Ear Canal Specimen which matched Marvanol DP standard. Analysis performed by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL ©2011



Name	Value	Unit
Name	MARVANOL DP	
Source of Sample	MARLOWE-VAN LOAN CORPORATION	
Technique	BETWEENSALTS	
Solution Data	pH= (ON DILUTION) 3.5-4.5	
Comments	EASILY DISPERSIBLE IN WARM WATER Chemical Description= SURFACTANT Description= SOFTENER; CATIONIC ACTIVITY 15%	

RESULTS AND OBSERVATIONS

- *Sample 19655/2A* black square particles did not produce a response using FTIR. It was analyzed using dispersive Raman spectroscopy with a 532 nm laser and was determined to be highly consistent with graphite.
- *Sample 19655/2B* body mass was determined to be a mixture of two compounds. One was highly consistent with glycerine; the other, the surfactant *Marvanol DP*. This portion of the spectrum is consistent with a long chain amide polymer.

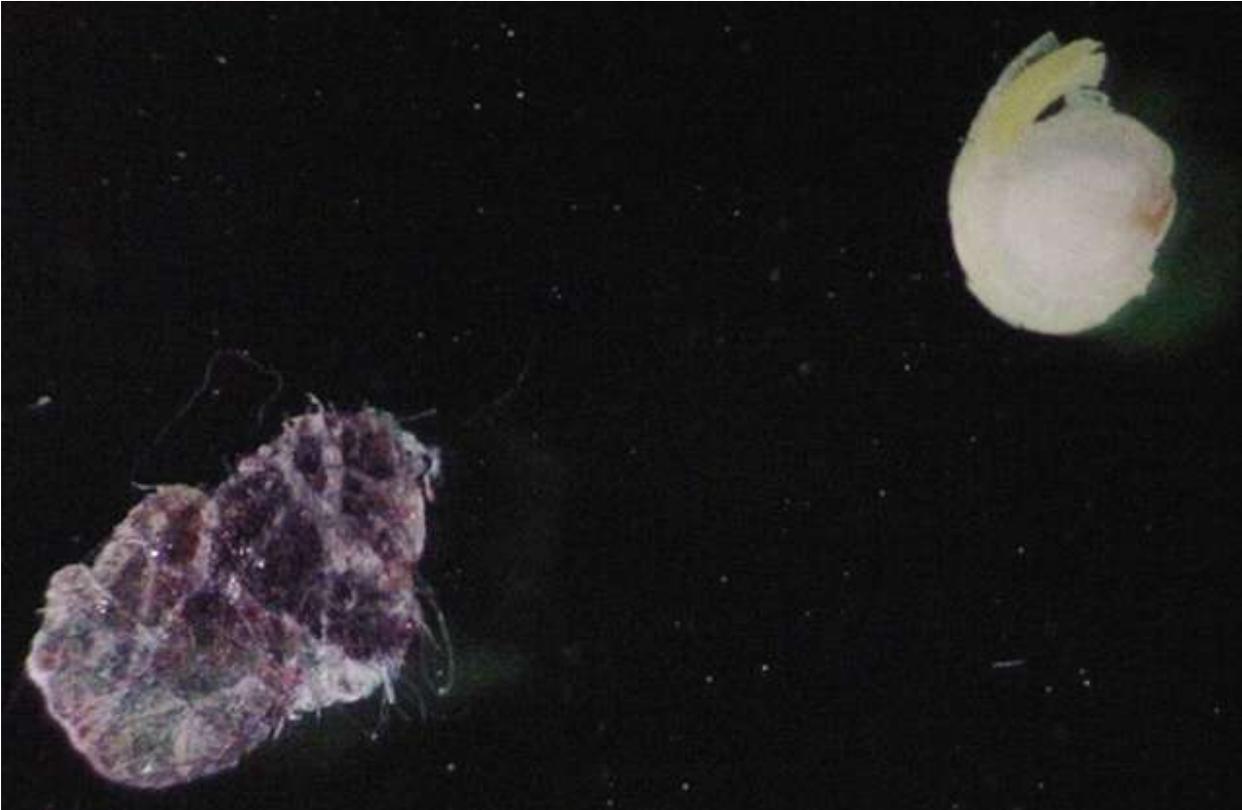
TABLE 1

Thorough Melting Point test on the "Brain Chip" of a Reactive Nematic Mesogen specimen from a Brain Tumor (Meningioma) specimen collected by *Integrative Health Systems™, LLC* on November 7, 2011, from the *Pathology Department* at *Cedar Sinai Hospital*, Los Angeles, CA as securely transported by *DiMatteo and Associates*, Moreno Valley, CA. The Melting point test was performed by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL.

RESULTS

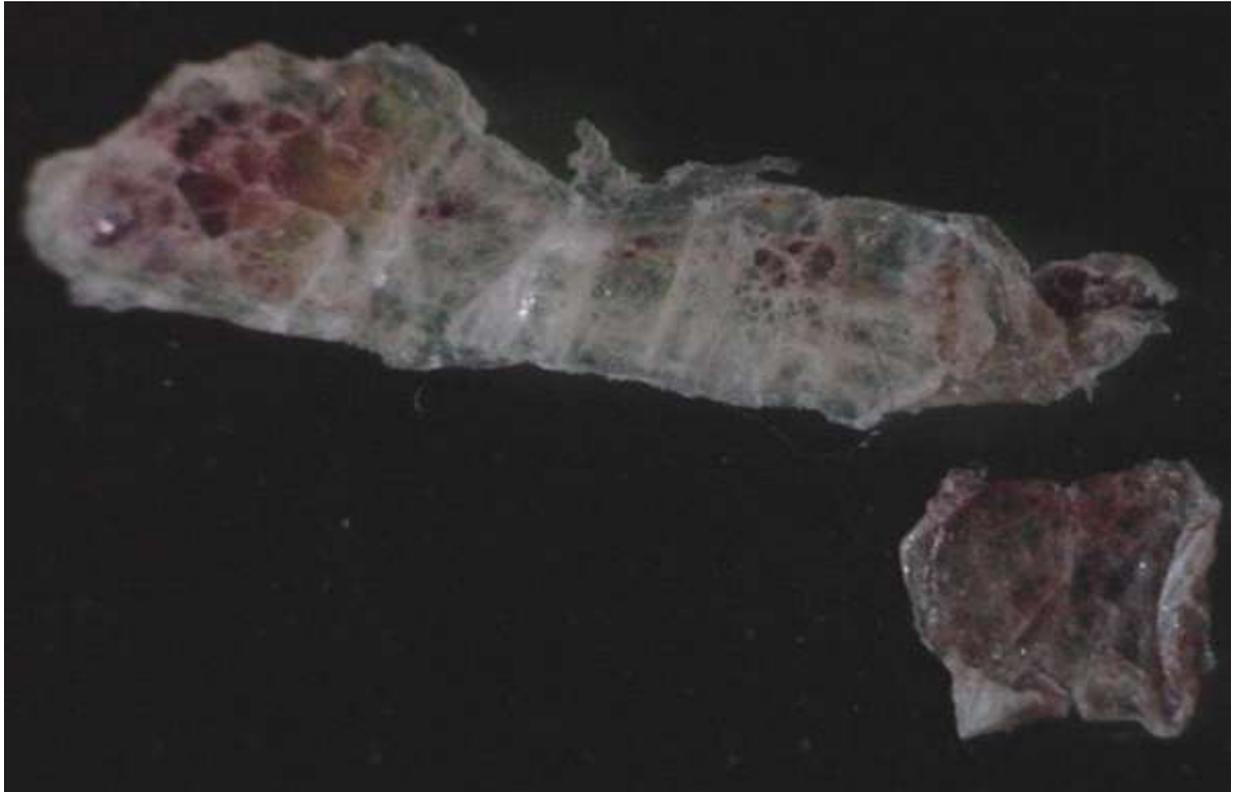
<u>Temperature (°C)</u>	<u>Observation</u>
300	No Change
375	Darkened and partially carbonized
400	Almost all the sample is black
450	Starts burning out
500	Powderizing
750	Hard powder
1000	Shrinkage, turning green
1100	Turns into hard green powder
>1100	No Change

PHOTOMICROGRAPH 1B - Spherical mesogen showing layers came from eye tear duct. Images taken by *Applied Consumer Services, Inc.* Hialeah Gardens, FL ©2011.



PHOTOMICROGRAPH 2 - Images of various types of Lyotropic Liquid Crystals and Metatropic Liquid Crystals taken from left arm skin surface.
Images taken by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL ©2011

L/N 19825/2 ARM LEFT MESOGEN



PHOTOMICROGRAPH 3A - Mesogen with directed energy thin coating.
Note the standard liquid crystal mesogen in center. Image taken by *Applied Consumer Services, Inc.*, Hialeah Gardens, FL ©2011

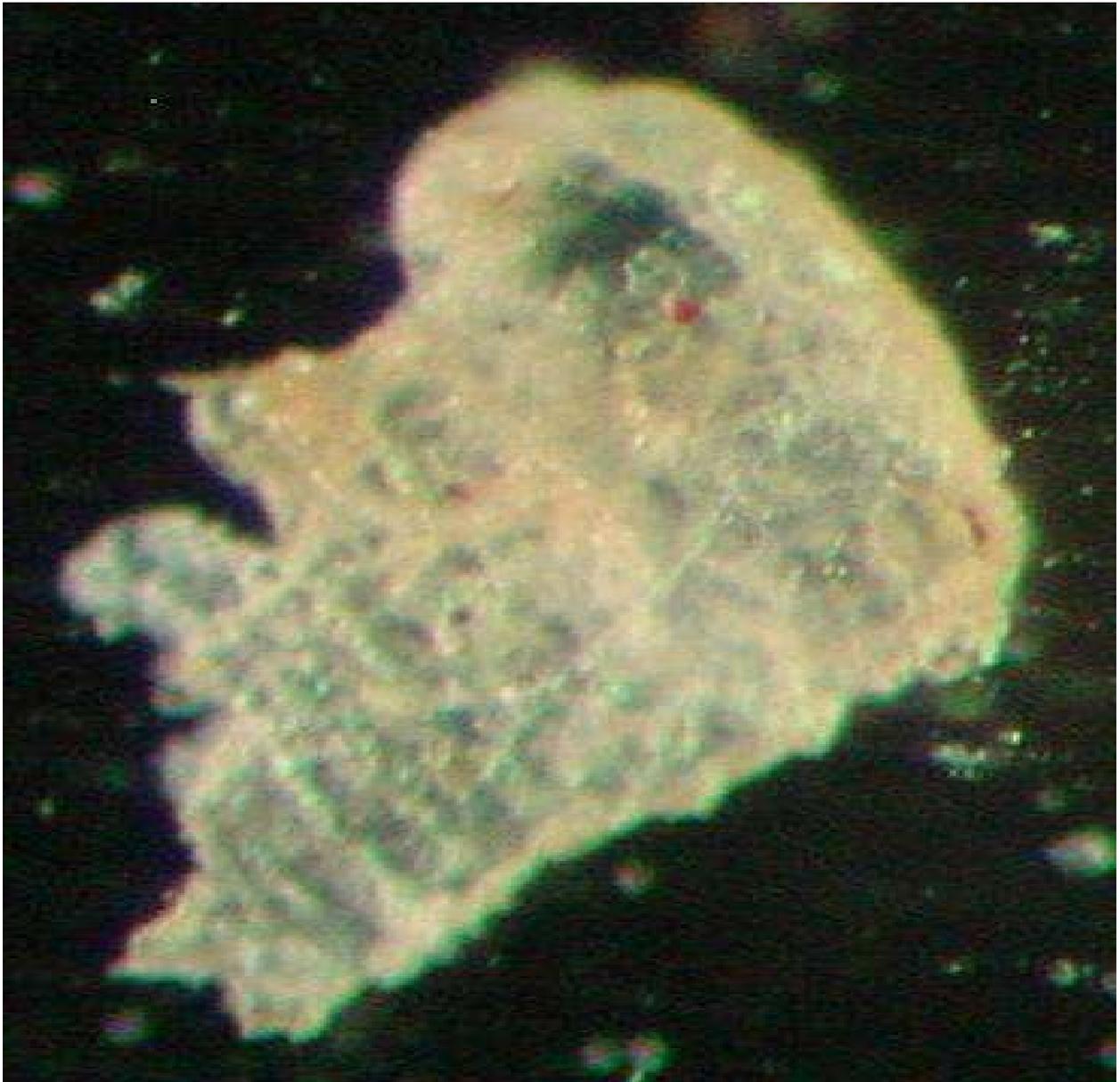


PHOTOMICROGRAPH 3 B, C AND D - Mesogens taken from nasal bulbs of separate individuals in Los Angeles, CA; NYC, New York; and Saudi Arabia. Analyses performed on the nano claws/hooks with Micro FTIR were shown to be "super glue."

NASAL BULB SPECIMEN – NEW YORK

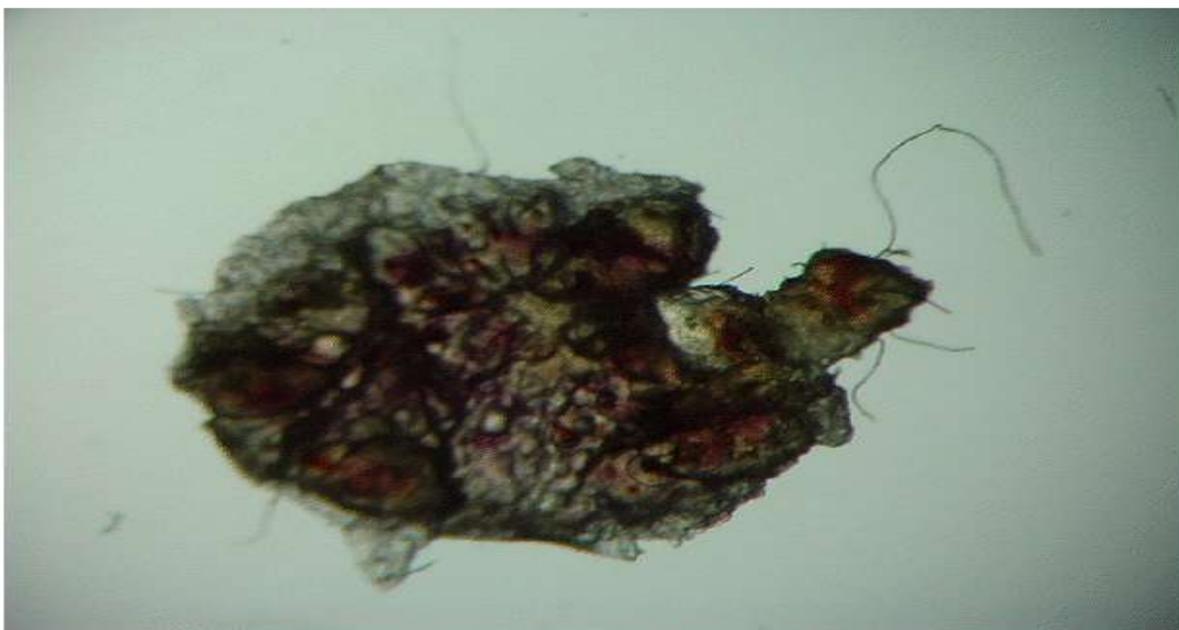


NASAL BULB SPECIMEN – SAUDI ARABIA

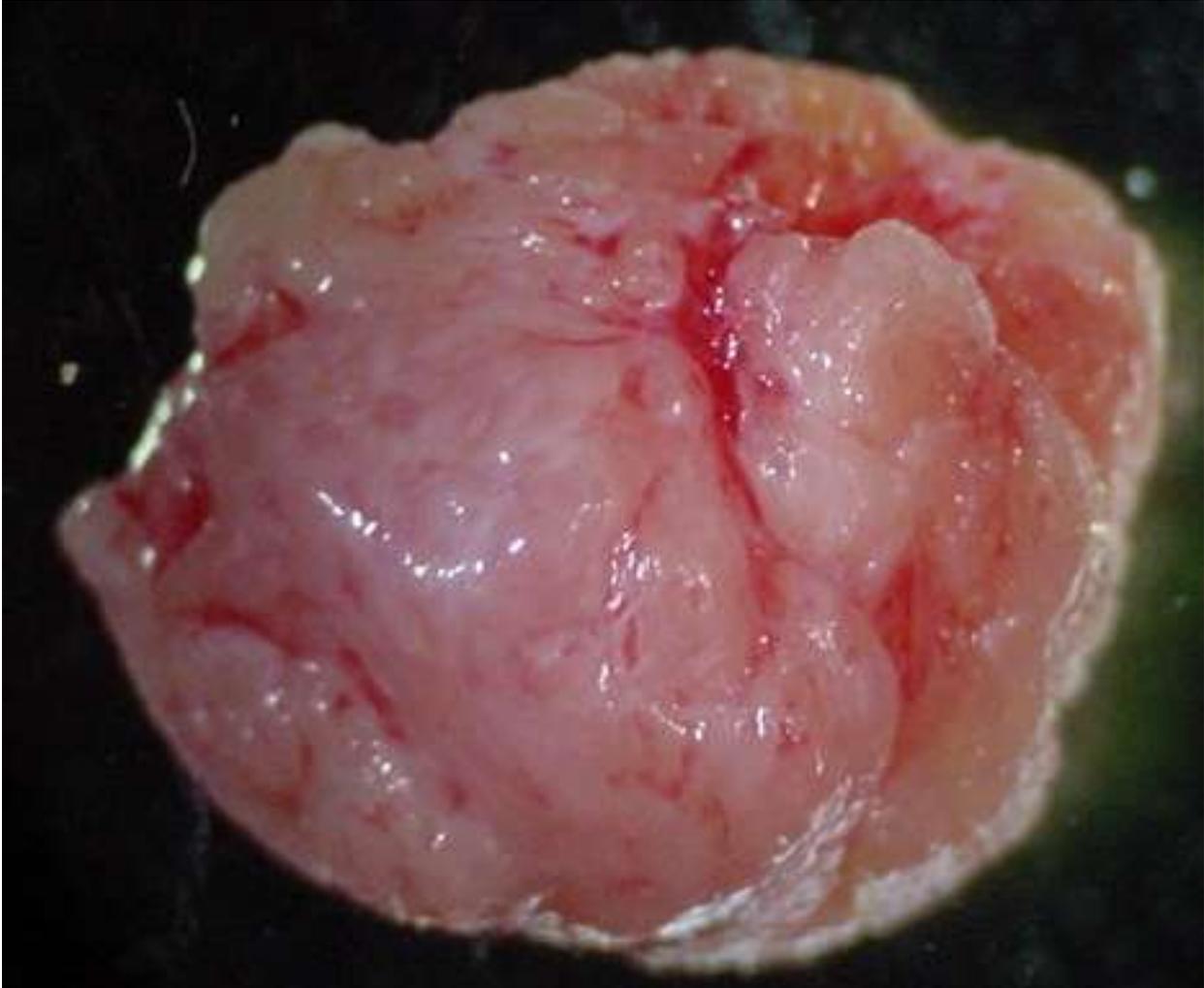


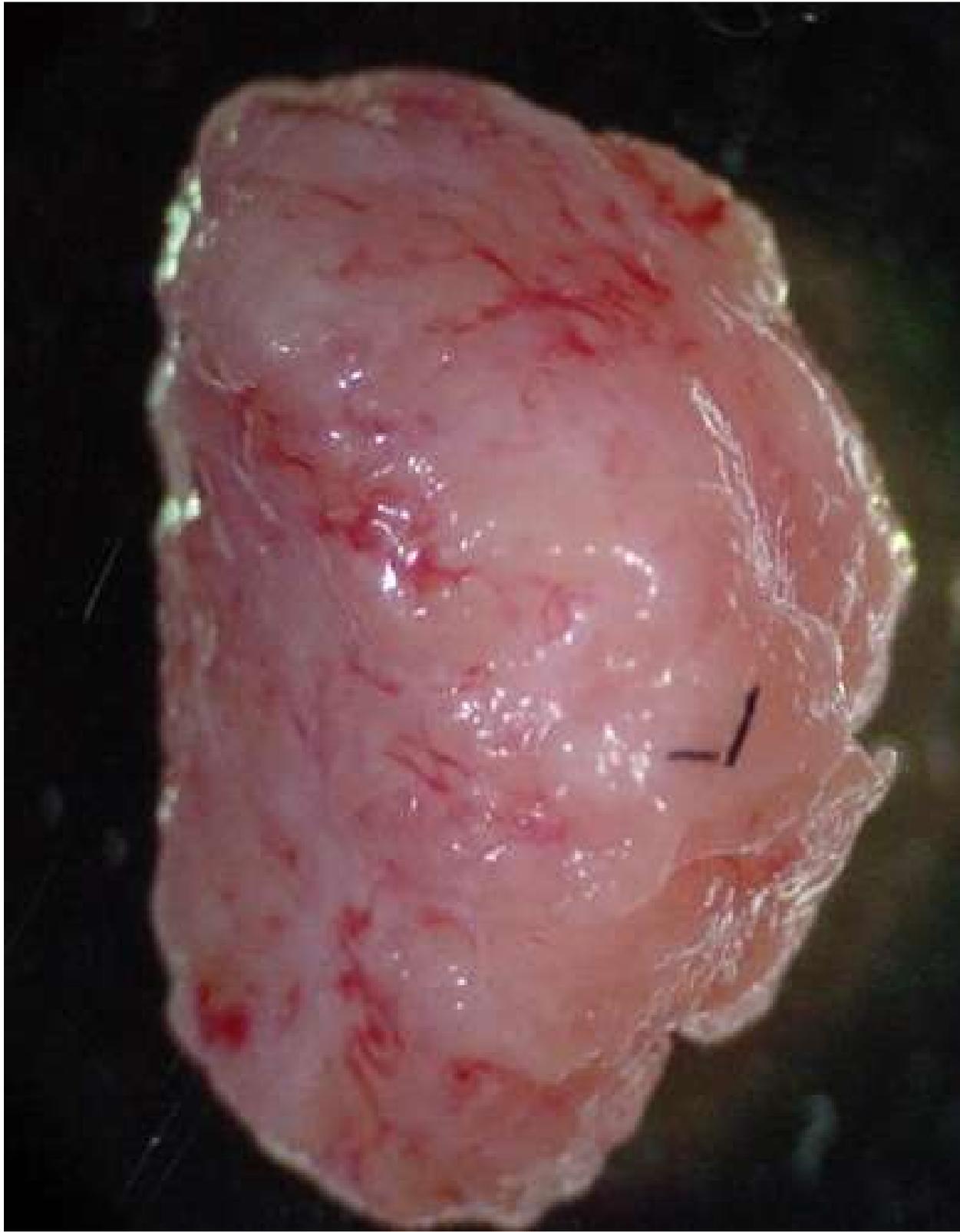
NASAL BULB SPECIMEN – LOS ANGELES

17733



PHOTOMICROGRAPH 4 - Brain Meningioma ("Brain Chip"), reactive nematic mesogen. Image taken by *Applied Consumer Services, Inc.*, Hialeah Gardens, Florida ©2011

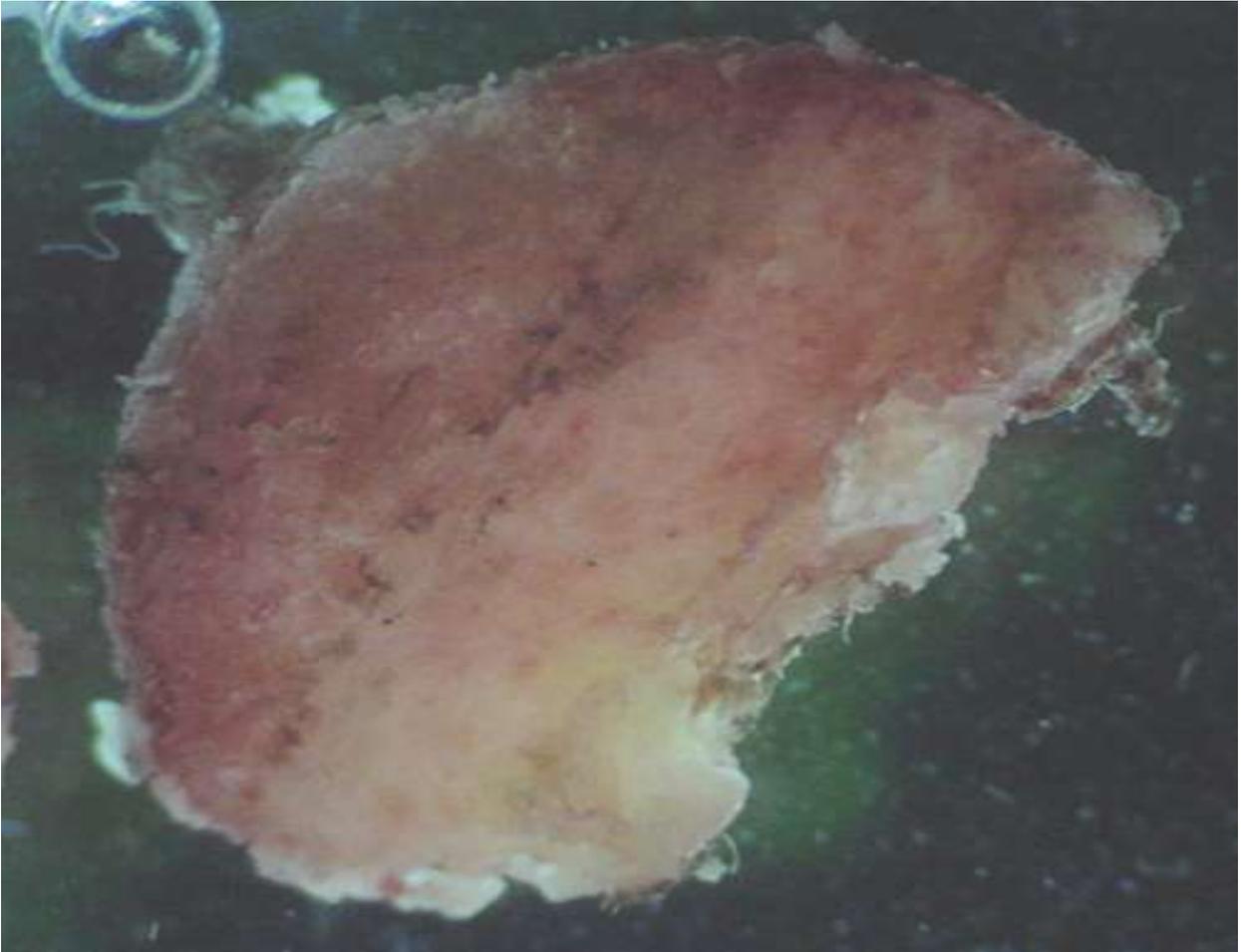


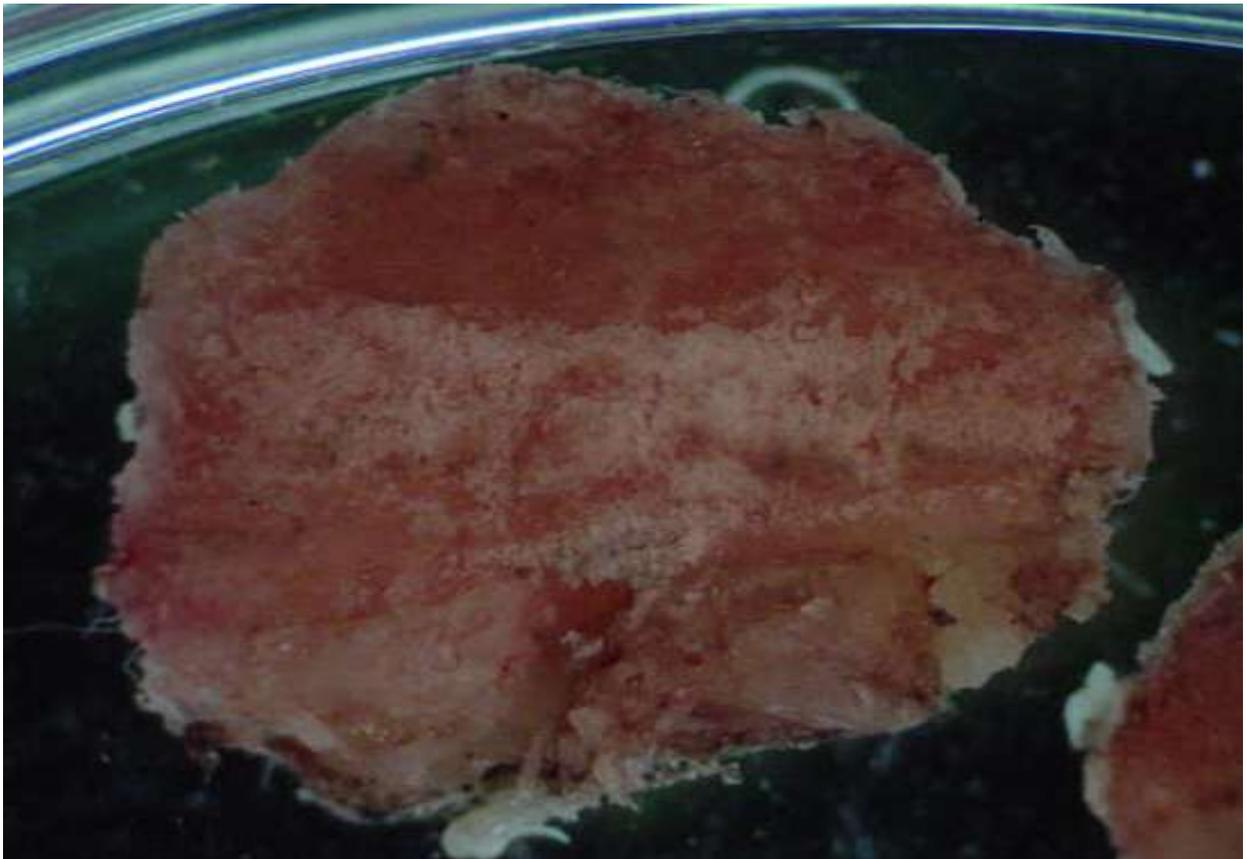
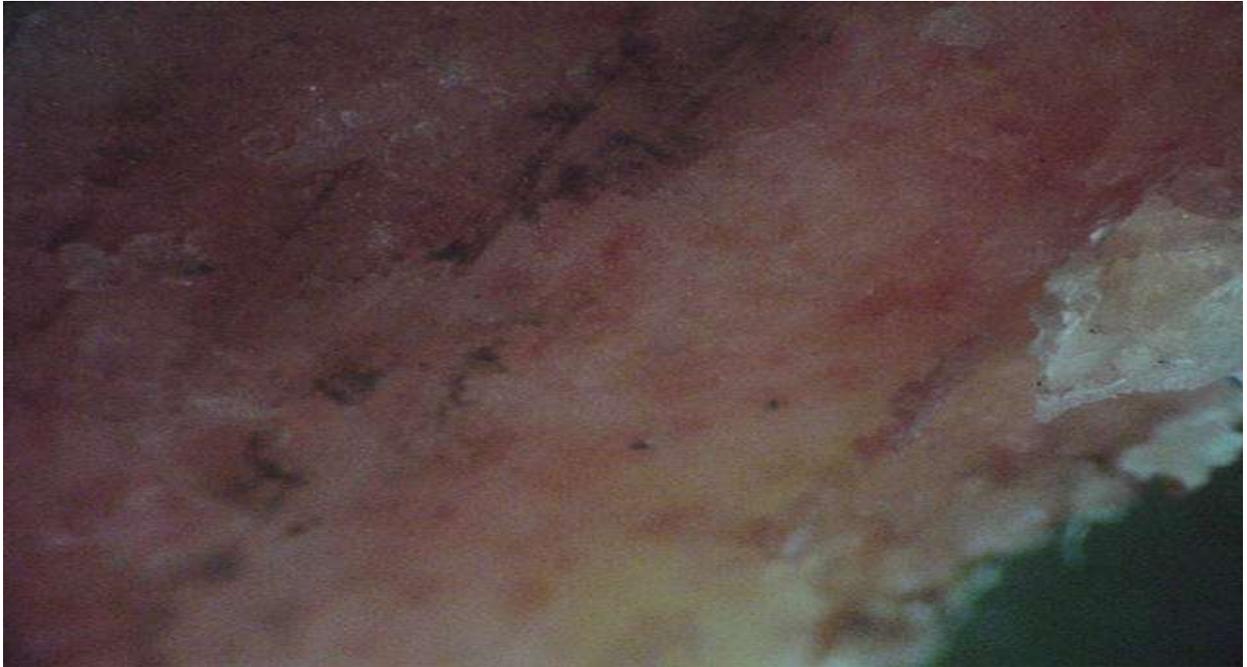




CUT SPHERE

(So hard that a diamond cutting saw had to be used)





PHOTOMICROGRAPH 5 - Images of Ear Canal Specimens. Images taken by *Applied Consumer Services, Inc.* Hialeah Gardens, FL ©2011

EAR CANAL SPECIMEN A



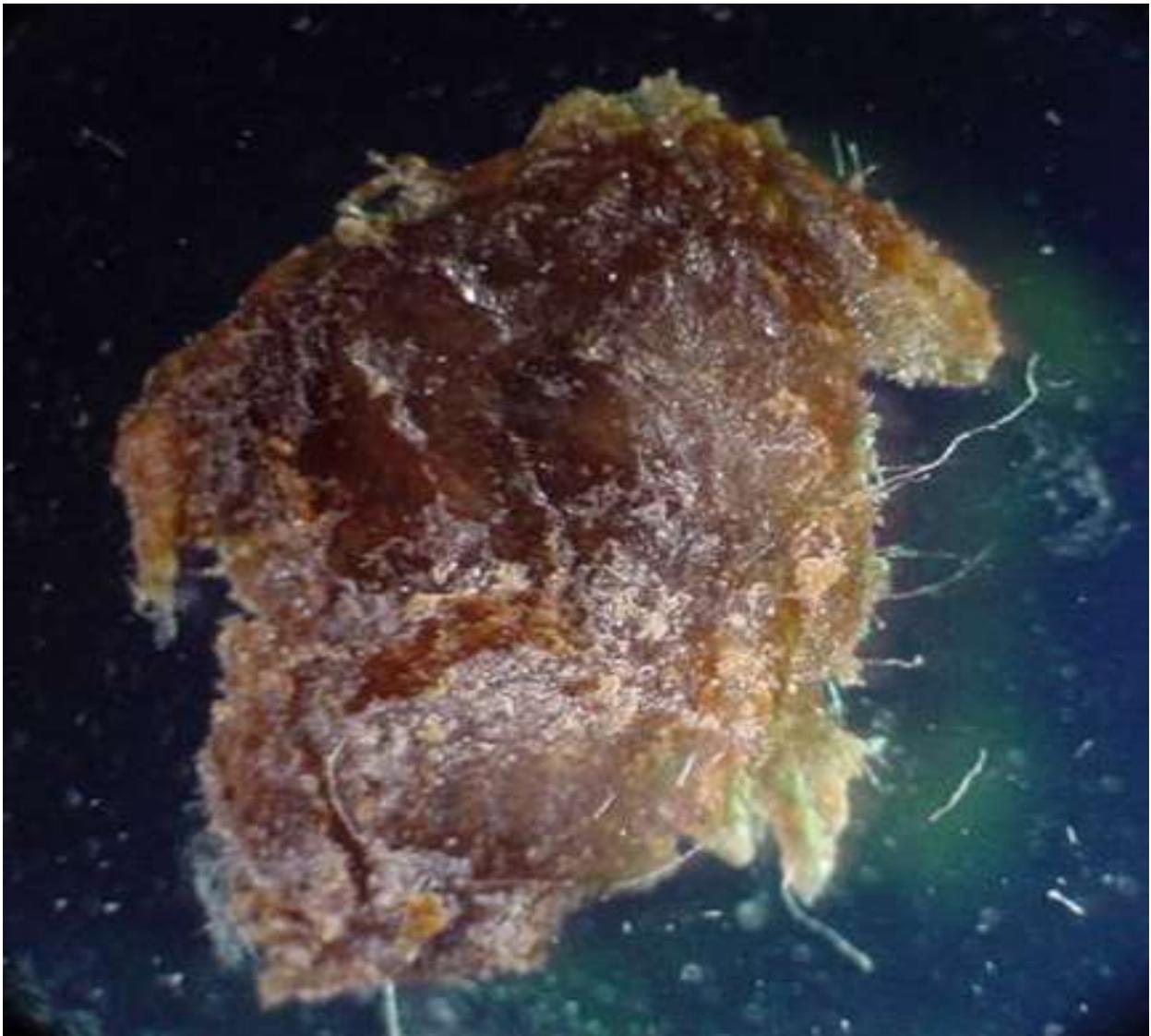
EAR CANAL SPECIMEN B



Ear Canal Wax Specimens

Note the fine nano materials and other materials. The black squares were determined to be graphite, which is a man-made compound. The material within the mesogenic nano building materials may actually be wax.

EAR CANAL WAX SPECIMEN A



EAR CANAL WAX SPECIMEN B

