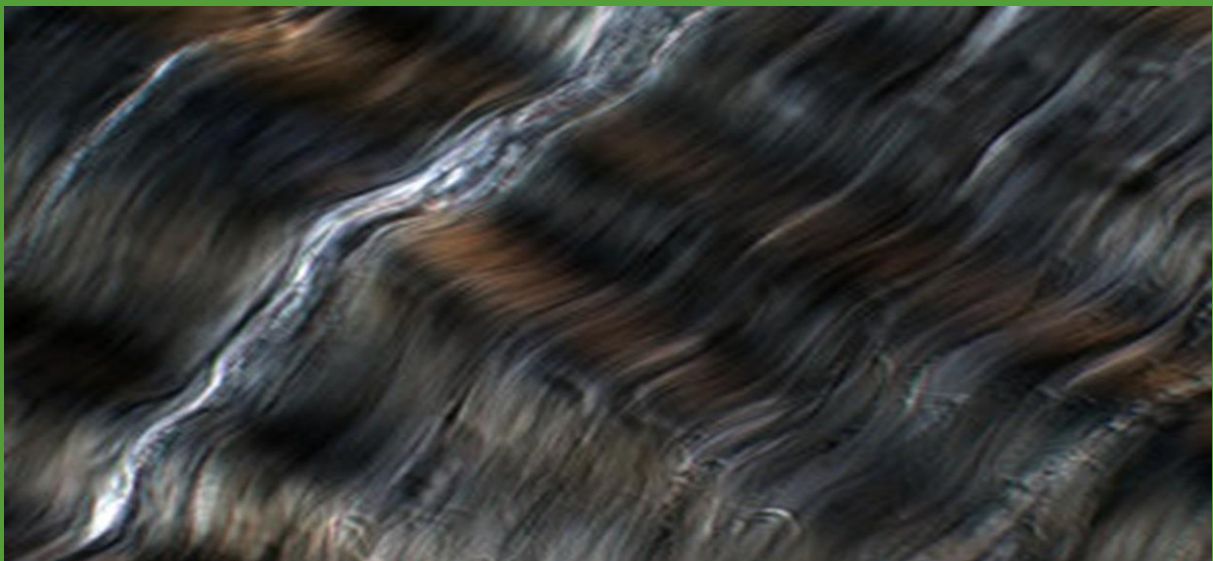


COLLAGEN DISORDERS AND HOMOEOPATHY



Dr. Rajneesh Kumar Sharma MD (Homoeopathy)

COLLAGEN DISORDERS AND HOMOEOPATHY

© Dr. Rajneesh Kumar Sharma MD (Homoeopathy)

Dr. Swati Vishnoi BHMS

Dr. Preetika Lakhera BHMS

Homoeo Cure Research Institute

NH 74- Moradabad Road

Kashipur (UTTARANCHAL) - INDIA

Ph- 09897618594

E. mail- drrajneeshhom@hotmail.com, www.treatmenthomeopathy.com, www.homeopathyworldcommunity.com

CONTENTS

Introduction	3
Etymology	3
Definition	3
Anatomy.....	3
Primary structure.....	3
Sec, Tertiary & Quaternary Structure	3
Collagen crimping	4
Synthesis of collagen	5
In Nucleus	5
In Cytoplasm	5
Extracellular	5
Regulation of Synthesis	5
Sequence of intracellular collagen biosynthesis	5
Sequence of extracellular collagen biosynthesis	5
Gene Expression	5
Regulation of Collagen Biosynthesis.....	6
Gene transcription	6
Post translational modification	6
Degradation of Collagen	6
Types.....	6
Endogenous collagen	6
Exogenous collagen	7
Causes of variations in collagen types	7
Fibrils forming collagens	7
Fibril associated collagens with interrupted triple helices (FACIT)	7
All other non fibrillar collagens	8
Functions.....	8
Collagen disorders	9

High sugar consumption	9
Smoking.....	9
Sunlight	9
Autoimmune disorders	9
Aging	9
Lupus Erythematosus.....	9
Scleroderma	9
Polyarteritis nodosa.....	10
Epidermolysis bullosa	10
Rheumatoid arthritis.....	10
Crohn`s disease	11
WegEner`s granulomatosis	11
Churg-Strauss syndrome.....	11
Microscopic polyangiitis	11
Polymyositis/dermatomyositis.....	11
Osteogenesis imperfecta	12
Chondrodysplasias.....	12
Ehler-Danlos Syndrome	12
Alport syndrome	12
Osteoporosis	12
Knobloch syndrome	12
Scurvy.....	13
Treatment	13
Medical uses of collagen.....	13
Skin fillers	13
Wound dressing.....	13
Guided tissue regeneration.....	13
Vascular prosthetics.....	13
Treatment of osteoarthritis.....	14
Skin revitalization.....	14
Homoeopathic remedies for collagen disorders.....	14
Bibliography	14

INTRODUCTION

- Collagen is a family of highly developed fibrous proteins found in all multicellular animals.
- 20 percent of the body's mass is made up of proteins, out of which, 30 percent is collagen protein.
- There are more than 16 types of collagen, but 80-90% of the collagen in the body comprises of types I, II, and III.
- Type I collagen fibrils are stronger than steel.
- Collagen is the main fibrous component of skin, bone, tendon, cartilage and periodontium.
- Collagen comprises about 90% of the organic matrix of the bone.
- Collagen is a natural protein that provides our bodies with structural support.
- Collagen gives the skin its strength and structure, and also plays a role in the replacement of dead skin cells.
- Aging is of two types, intrinsic and extrinsic. In intrinsic aging, collagen production declines with age, and in extrinsic aging, it is reduced by exposure to ultraviolet light and other environmental factors.
- Collagen dressings fascinate new skin cells to wound sites.
- Collagen production can be stimulated through the use of laser therapy and the use of all trans retinoic acid, a form of vitamin A.
- Sunlight, smoking and high sugar consumption reduce collagen in body.

ETYMOLOGY

Collagen- Greek "kolla," means glue, "gen" means to produce.

DEFINITION

Collagen is the most abundant, hard, insoluble and fibrous protein that makes up one-third of the protein in the human body, found in the bones, muscles, skin and tendons, forming a framework to provide strength and structure thus holding the whole body together.

ANATOMY

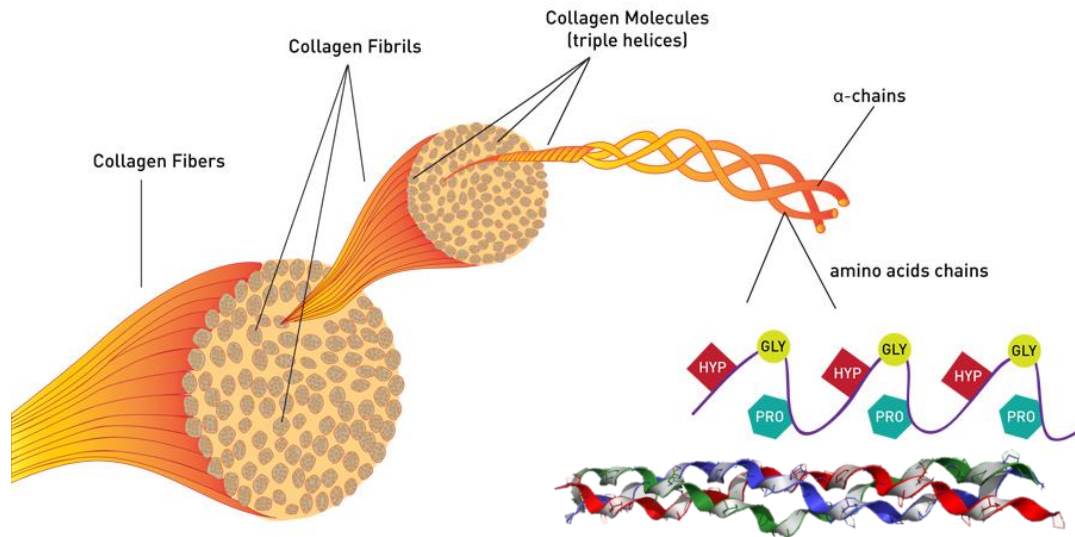
As a group of proteins, collagens contain a number of characteristic features that distinguish them from other matrix molecules. All collagens are composed of 3 polypeptide alpha chains coiled around each other to form the tripe helix configuration. The individual polypeptide chains of collagen each contain approximately 1000 amino acid residues.

PRIMARY STRUCTURE

Each polypeptide chain in type I collagen contains 1056 amino acids residues. 90% of them are in the form of repeating (Glycine-proline-hydroxyproline pattern). These 2 amino acids together with glycine at every 3rd residue, gives the featured conformation to collagen molecules.

SEC, TERTIARY & QUATERNARY STRUCTURE

Collagen is a rod-shaped molecule, about 3,000 Å long and only 15 Å thick. Its three helically intertwined chains may have different sequences, but each has about 1,000 amino acid residues. Collagen fibrils are made up of collagen molecules aligned in a staggered fashion and cross linked for strength. The specific alignment and degree of cross-linking vary with the tissue. Collagen consists of three chains that intertwine to form a triple helix (Collagen contains about 1000 amino acids, one third of which are glycine. In the majority of collagens, the molecules are packed together to form very similar long thin fibrils.



Collagen involves a family of genetically distinct molecules, all of which have a unique triple helix configuration of three polypeptide subunits known as alpha-chains.

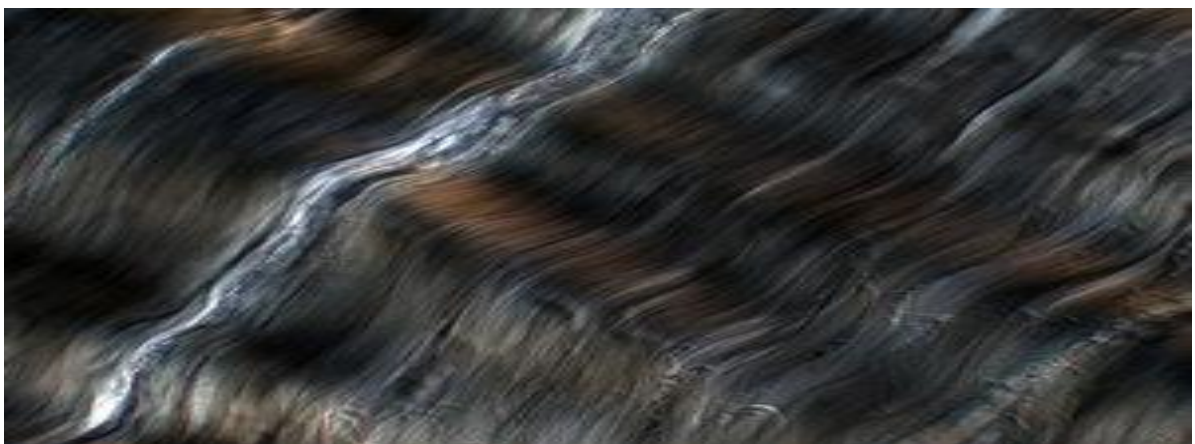
Each chain contains around 1,000 amino acids, and usually has an amino acid sequence comprising of glycine, proline and hydroxyproline.

- Proline helps in the formation of helical orientation of each α chain.
- Glycine is the smallest amino acid found in every 3rd position in the polypeptide chain.
- Hydroxyproline and hydroxylysine are two unique amino acids.
- Each collagen molecule is stabilized through lysine derived intra and intermolecular cross links.
- Each α chain comprises of around 1056 amino acids.
- There are around 3 amino acids per turn.

COLLAGEN CRIMPING

The complex 3D arrangement of fibers also means that some bundles would always be placed in tension, irrespective of the direction of an applied force. This enables local areas of the PDL to resist compressive forces.

Collagenous tissues exhibit a calculable periodicity of structure of variable scale, the waveform that describes this periodicity has been referred to as crimp. In the polarizing microscope crimping can be seen by regular banding of dark lines across the bundles.



SYNTHESIS OF COLLAGEN

The polypeptide chains of procollagen are synthesized on the rough endoplasmic reticulum, and the signal (pre) sequence is cleaved. Proline and lysine residues are hydroxylated by a reaction that requires O₂ and vitamin C. Galactose and glucose are added to hydroxylysine residues. The triple helix forms, and procollagen is secreted from the cell and cleaved to form collagen. Cross-links are produced. The side chains of lysine and hydroxylysine residues are oxidized to form aldehydes, which can undergo aldol condensation or form Schiff bases with the amino groups of lysine residues. The entire process of collagen synthesis can be best understood under the following stages-

IN NUCLEUS

Gene Expression

IN CYTOPLASM

Translational and post translational events or intracellular steps in collagen synthesis procollagen formation

EXTRACELLULAR

Extracellular collagen biosynthetic events

REGULATION OF SYNTHESIS

By different genes and factors

SEQUENCE OF INTRACELLULAR COLLAGEN BIOSYNTHESIS

- Assembly of proalpha chains (directed by specific mRNAs)
- Proline hydroxylation
- Lysine hydroxylation
- Hydroxylysine glycosylation
- Disulphide bond formation/incorporation of C Terminal Propeptides
- Secretion

SEQUENCE OF EXTRACELLULAR COLLAGEN BIOSYNTHESIS

- Amino terminal extension cleavage
- Carboxyl terminal extension cleavage
- Microfibril formation
- Lysine hydroxylysine terminal NH₂ oxidation (Cu-containing lysyl oxidase)
- Fibril formation
- Reducible cross-link formation
- Maturation of cross-links.
- Growth and reorganization of fibers.

GENE EXPRESSION

Collagen genes are large and range in size from 5kb for (COL1A1) TO 130 kb for COL1A31. More than 30 genes have been described for collagen types I to type XIX.

Although differences exist among various collagen genes, those coding for “Fibril forming collagens” have similar exon arrangement. These genes have 42 exons for the major triple helical region. Most of these exons are composed of 54 bp (or multiple) & start with an intact codon for glycine.

Type 1 - COL1A1

Type 2 - COL2A1

Type 3 - COL3A1

Type 5- COL4A1 - COL4A6

REGULATION OF COLLAGEN BIOSYNTHESIS

Collagen biosynthesis is tightly regulated during normal development & homeostasis in a cell & tissue specific manner.

GENE TRANSCRIPTION

- The changes at the gene transcription stage are reflected by decrease in the mRNA levels and unstable mRNA. (Psora/ Syphilis)
- Post Translationally Collagen synthesis is regulated by the extent of prolyl hydroxylation. (Psora)
- Collagen genes contain CIS-regulatory sequences, promoters and enhancers. (Psora/Sycosis)

POST TRANSLATIONAL MODIFICATION

- Under Hydroxylation results in decreased stability of the collagen molecule which is then degraded (Psora/ Syphilis).
- Gene transcription is regulated by binding of protein transcription factors to the sequences. e.g. TGF- β activates collagenase gene transcription through regulatory DNA sequence that binds to NF-1 (Psora).
- Correct amount of hydroxylation results in the production of stable and strong collagen fibers.

DEGRADATION OF COLLAGEN

- Break down of the collagen matrix element is a key component of any normal tissue that is undergoing morphogenesis and growth (Psora/ Syphilis). But it is vital that this process is kept under rigid control.
- Although several enzymes are involved in the destruction of matrix components (Syphilis) collagen breakdown is mediated primarily by the COLLAGENASES (Type of MMP) (Psora). These are specialized enzymes that have evolved specifically to hydrolyze collagens (Psora), because their triple helical collagen structure is resistant to most common proteinases.

TYPES

Many genetically, chemically, and immunologically distinct types of collagen have been identified. At least 16 types of collagen are identified but 80-90% of collagens in the body belong to types I, II and III. The collagens in the human body are strong and flexible. Type I collagen fibrils are particularly tensile, and are stronger than steel.

ENDOGENOUS COLLAGEN

Collagen synthesized by the body plays numerous important roles in health. Breakdown and depletion of the body's natural collagen is associated with a number of health problems (Psora/ Syphilis).

EXOGENOUS COLLAGEN

It is also called supplemental collagen and is used for medical and cosmetic purposes, including to help with healing and repair of the body's tissues.

Collagen class	Type	Tissue Distribution
Fibril-forming	I	Most connective tissue
	II	Cartilage and vitreous humors (e.g. skin and lung)
	III	Tissue containing collagen I
	V	Cartilage
	XI	Bone and cornea
	XXIV	Eye, ear and lung
	XXVII	Cartilage
Fibril-associated	IX	Cartilage
	XII	Tissue containing collagen I
	XIV	Tissue containing collagen I
	XVI	Many tissue
	XIX	Many tissue
	XX	Cornea
	XXI	Many tissue
	XXII	Cell junctions
	XXVI	Testis and ovary
Network forming	IV	Basal laminae
	VIII	Many tissues
	X	Cartilage
Anchoring fibrils	VII	Attachment of basal laminae to underlying connective tissue
Transmembrane	XVII	Skin hemidesmosomes
	XXV	Nerve cells

CAUSES OF VARIATIONS IN COLLAGEN TYPES

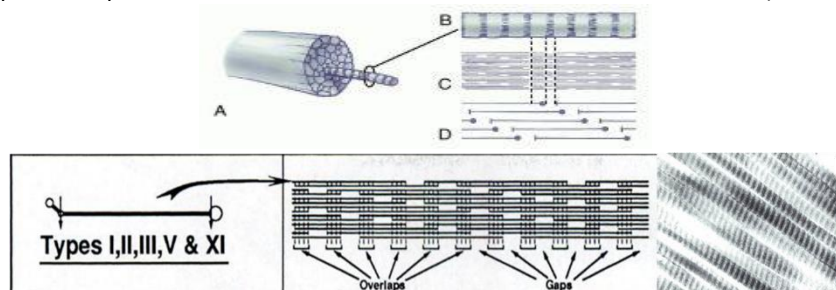
- Differences in the assembly of basic polypeptide chains (Psora/ Syphilis)
- Different lengths of the helix (Psora/ Syphilis/ Sycosis)
- Various interruptions in the helix and (Psora)
- Differences in the terminations of the helical domains (Psora)

Collagens are divided roughly into 3 groups based on their abilities to form fibrils-

FIBRILS FORMING COLLAGENS

This group of collagens forms banded fibrils. Their triple helical domain contains an uninterrupted stretch of 338 to 343 Glycine – proline – hydroxyproline triplets in each α chain and the molecule measures $15 \times 3000 \text{ \AA}$ (Psora/ Syphilis). This group includes-

- Type I
- Type II
- Type III
- Type V
- Type XI



FIBRIL ASSOCIATED COLLAGENS WITH INTERRUPTED TRIPLE HELICES (FACIT)

This group of collagens consists of proteins in which collagenous domains are interrupted by non-collagenous sequences. These are associated with the surface of fibril forming collagens (Psora/ Sycosis).

It includes type IX, type XII, type XIV and perhaps type XVI also. The former three are unique in containing glycosaminoglycan components covalently linked to the protein molecule.

ALL OTHER NON FIBRILLAR COLLAGENS

These form this third group which includes-

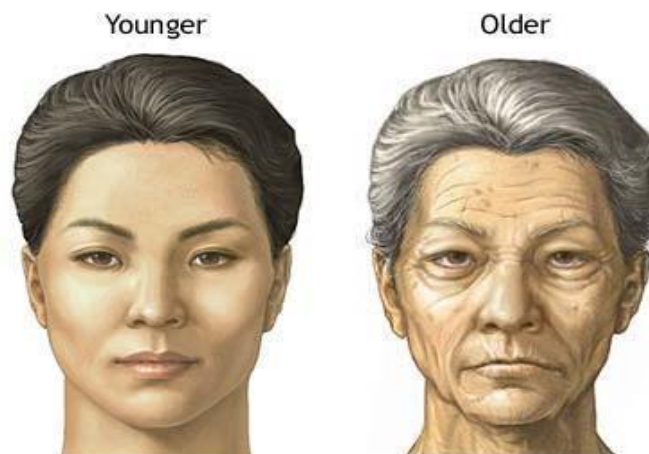
- Type IV, type VIII and type X (network forming collagens) (Psora/ Sycosis)
- Type VI (beaded fibril forming collagen) (Psora/ Sycosis)
- Type VII (anchoring fibrils and invertebrate cuticle collagen) (Psora/ Sycosis)

In addition to the above collagen groups at least 10 non collagenous proteins incorporating short triple helical collagen domains have been described. These proteins are not considered true collagens because they do not form a part of the extracellular matrix. This group of collagen domain containing non matrix protein molecules includes (10 Non Collagenous Proteins) (Psora)-

- C1q component of C1 complement
- Lung surfactant protein
- Acetylcholine esterase
- Conglutinin
- Mannose binding protein

FUNCTIONS

- Provides structural support, strength and a degree of elasticity, in combination with elastin.
- Extracellular matrix collagen forms a complicated network of macromolecules that determine the physical properties of body tissues.
- In the dermis, collagen helps to form a fibrous network, upon which new cells can grow.
- Required in the replacement and restoration of dead skin cells.
- Some collagens also function as protective coverings for delicate organs in the body such as the kidneys.
- Collagen production naturally declines with age, reducing the structural integrity of the skin and leading to sagging skin, the formation of lines and wrinkles and the weakening of cartilage in joints, in males after 40 years of age and in females after menopause.
- Its production declines drastically after 60s causing a lot of wrinkles and age marks.



COLLAGEN DISORDERS

Before looking for collagen disorders, we must learn about the factors affecting collagen tissue. There are a number of factors that can deplete the levels of collagen found within the body-

HIGH SUGAR CONSUMPTION

High sugar diet increases the rate of glycation, a process whereby sugar in the blood attaches to proteins to form new molecules called advanced glycation end products (AGEs). AGEs damage adjacent proteins and can make collagen dry, brittle, and weak.

SMOKING

Alkaloids present in tobacco smoke damage both collagen and elastin in the skin. Nicotine also narrows the blood vessels in the outer layers of the skin, which compromises the transport of nutrients and oxygen to the skin, negotiating skin health.

SUNLIGHT

Ultraviolet rays in sunlight cause collagen to break down at an increased rate, damaging collagen fibers and inducing the accumulation of abnormal elastin. Abnormal elastin leads to the production of an enzyme that can also break down collagen, leading to the formation of solar scars.

AUTOIMMUNE DISORDERS

Some autoimmune disorders cause antibodies to target collagen. Mutations to the genes responsible for the coding of collagen alpha-chains can affect the extracellular matrix, leading to a decrease in the amount of collagen secreted, or to the secretion of dysfunctional mutant collagen. This may lead to a number of disorders.

AGING

Collagen levels deplete naturally over time due to intrinsic aging. However, by taking precautionary measures, it is possible to reduce extrinsic aging and protect collagen, keeping the skin, bones, muscles and joints healthy for longer.

Some common collagen disorders are given below-

LUPUS ERYTHEMATOSUS

Systemic lupus erythematosus (SLE) is an autoimmune connective tissue disease in which the body's immune system mistakenly attacks healthy tissue and causes inflammation, necrosis and degeneration of collagen. It can affect the skin, joints, kidneys, brain, and other organs. (Psora/ Sycosis/ Syphilis)

Remedies- Carb-an. sanic. SEP. syph. tril-p.

SCLERODERMA

Scleroderma, also known as systemic sclerosis, is a chronic systemic autoimmune disease characterized by hardening (sclero) of the skin (derma). Symptoms include tightening of the skin, joint pain, exaggerated response to cold (Raynaud's disease) and heartburn. (Psora/ Sycosis/ Syphilis)

Remedies- alum. **Ant-c.** arg-n. ars. berb-a. brass-n-o. **Bry.** caust. **Crot-t.** echi. **Elae.** **Hydr.** kali-c. lyc. petr. **Phos.** rad-br. ran-b. rhus-r. sarcol-ac. sars. sep. sil. still. sulph. syc. thiosin. thyr. x-ray

POLYARTERITIS NODOSA

Polyarteritis nodosa (PAN) is a rare connective tissue disease that results in vasculitis causing injury to organ systems. It is a systemic vasculitis characterized by necrotizing inflammatory lesions that affect medium-sized and small muscular arteries, preferentially at vessel bifurcations, resulting in microaneurysm formation, aneurysmal rupture with hemorrhage, thrombosis, and, consequently, organ ischemia or infarction. (Psora/Syphilis)

Remedies- acon. agar. **All-c.** aml-ns. ant-c. **Ant-t.** apis arist-cl. **ARN.** **Ars-i.** **ARS.** aur. **Bapt.** **BAR-C.** **Bar-m.** bell-p-sp. bell-p. **BELL.** both. **BRY.** bufo cact. calc-ar. **Calc-f.** calc-p. **CALC.** canth. carb-an. **CARB-V.** carbn-s. card-m. **Cham.** **Chin.** chlam-tr. chlorpr. conv. **Crot-h.** **Cupr.** eberth. echi. eucal. **Ferr-p.** ferr. **Fl-ac.** gels. glon. graph. guaj. **Ham.** hecla hell. hep. **Hippoz.** hir. hist. **Hyos.** ign. influ. ins. **Iod.** **Kali-c.** kali-chl. **Kali-i.** kali-m. kalm. kreos. **LACH.** **Led.** lith-c. **Lyc.** **Lycps-v.** mag-c. mag-f. magn-gr. merc-cy. merc-i-r. merc. morg-p. morph. **Mur-ac.** **Nat-i.** nat-m. **Nat-s.** nux-v. parathyr. **Phos.** plb-xyz. plb. prot. **PULS.** ran-b. ran-s. rhod. **RHUS-T.** ruta sacch. sang. sec. **Sep.** **Sil.** spig. **Spong.** streptoc. stront-br. stront-c. sul-ac. sulfa. **Sulph.** syph. thiop. **Thuj.** tril-p. tub. **Verat-v.** **VERAT.** vip-a. **VIP.** zinc.

EPIDERMOLYSIS BULLOSA

Epidermolysis bullosa (EB) is a genetic skin disorder characterized clinically by blister formation from mechanical trauma. (Psora/ Sycosis)

Remedies- **Acon.** agn. ail. all-c. alum-sil. alum. am-c. ambr. **Anac.** **ANT-C.** **Apis** arist-cl. **Arn.** ars-s-f. ars-s-r. **Ars.** **Asaf.** aur-ar. aur-s. **Aur.** bad. **Bar-c.** **Bar-m.** bell-p. bell. beryl. **Borx.** bov. **Brom.** bry. **Bufo** **Calc.** camph. cann-s. **Canth.** carb-an. carbn-s. **CAUST.** **CHAM.** chel. chin. chir-fl. chlol. cina **Clem.** cocc. colch. com. con. cortico. croc. crot-h. crot-t. **Dulc.** dys. euph. falco-pe. **Gels.** graph. **HEP.** heroin. hyos. **Kali-ar.** kali-bi. **Kali-c.** kali-i. **Kali-s.** kali-sil. kreos. lach. loxo-lae. loxo-recl. lyc. m-arct. **Mag-c.** manc. mand. mang. med. merc-c. **Merc.** mez. moni. morb. myris. nat-ar. **Nat-c.** nat-m. nat-p. nat-s. **Nit-ac.** ped. **Petr.** ph-ac. phos. physala-p. plb-i. **Plb.** plut-n. podo. positr. prim-o. prot. psor. **PULS.** **Ran-b.** **Ran-s.** **RHUS-T.** rhus-v. ruta sec. sedi. sep. **SIL.** spiros-af. **Staph.** sulph. syc. syph. tarent-c. urt-u. verat. vip. x-ray zinc.

RHEUMATOID ARTHRITIS

Rheumatoid arthritis (RA) is the most common type of connective tissue disorder, causing chronic autoimmune arthritis. It is triggered by a faulty immune system and affects the wrist and small joints of the hand, including the knuckles and the middle joints of the fingers. In this systemic disorder, immune cells attack and inflame the membrane around joints. It also can affect the heart, lungs, and eyes. It affects many more women than men. (Psora/ Sycosis).

Remedies- abrom-a. abrot. **Acon.** act-sp. aesc. agar. agn. all-c. am-be. am-c. am-caust. ant-c. **Ant-t.** **Apis** apoc. arg-met. **Arn.** ars. ars-i. **Ars-s-f.** asc-c. asc-t. **AUR.** aur-m. bacis-10. bacis-7. bar-act. **Bell.** **Benz-ac.** berb. **BRY.** **Cact.** caj. **Calc.** **CALC-P.** **Calc-s.** camph. cann-s. carbn-s. carc. **Casc.** caul. **CAUST.** cedr. **Cham.** **Chel.** **Chim.** chin. **Chinin-s.** chl-f. **Cimic.** clem. **Cocc.** **COLCH.** **Colchin.** **Coloc.** corv-cor. dig. dios. dros. **Dulc.** **Eup-per.** euphr. fago. **Ferr.** ferr-i. **FERR-P.** ferr-pic. fic-m. flav. **FORM.** form-ac. franc. gaul. gels. germ-met. gins. gonotox. **Guaj.** ham. **Hep.** hymos. ign. indg. **IOD.** **KALI-BI.** kali-c. **Kali-chl.** **Kali-i.** kali-m. kali-p. **Kali-s.** **Kalm.** kreos. **Lac-ac.** **Lac-c.** **Lach.** lap-la. **Led.** lith-be. **LYC.** macro. mag-p. mand. **Mang.** meli. **Merc.** meth-sal. mez. morg. nat-lac. **Nat-m.** nat-p. nat-pyru. **Nat-s.** nat-sal. **Nux-v.** nyct. ol-j. **Olib-sac.** ox-ac. petr. **Phos.** **Phyt.** pic-ac. pin-s. **Prop.** prot. psor. **Puls.** **Rad-met.** ran-b. **Rham-cal.** rheum **Rhod.** **RHUS-T.** rumx. **Ruta** sabin. **Sal-ac.** salol. **Sang.** sec. senec. sep. **SPIG.** spong. **Staph.** **Stel.** stict. still. stront-c. stry. sul-i. **Sulph.** syph. **Ter.** teucr. **thuj.** til. vac. verat. **Verat-v.** **Viol-o.** viol-t.

CROHN'S DISEASE

Crohn's disease (CD) is an inflammatory bowel disease (IBD), causing inflammation of the lining of digestive tract, leading to abdominal pain, severe diarrhea, fatigue, weight loss and malnutrition. It is characterized by inflammation, muscle layer overgrowth, and collagenous fibrosis of the intestinal tract. (Psora/ Sycosis/ Syphilis)

Remedies- **Acet-ac.** **ACON.** aloe alumn. ant-c. **ANT-T.** **APIS** Arg-n. arist-cl. **Arn.** ars-i. **ARS.** asc-c. atro. aur. **Bapt.** **BELL.** berb. brom. **BRY.** bufo but-ac. **Cact.** cadm-s. **Calad.** calc-sil. **Calc.** **Canth.** caps. **Carb-v.** **Card-m.** **Cham.** chel. **Chin.** cic. cocc. coff. **COLCH.** coli. coll. **Coloc.** **Crot-c.** **Crot-h.** cupr. cyt-l. **Dios.** eberth. **Echi.** enteroc. euph. ferr-ar. ferr-p. **Ferr.** gamb. gast. **Gels.** gins. graph. guaj. hep. **Hydr.** **HYOS.** influ. iod. **Ip.** iris-t. kali-ar. **Kali-bi.** **Kali-c.** **Kali-chl.** kali-i. kali-m. **Kali-n.** kali-p. lac-d. **LACH.** lat-m. **LAUR.** levist. **LYC.** mag-s. malar. med. **Merc-c.** merc-d. **MERC.** Mez. nat-m. **Nat-s.** nit-ac. **Nux-v.** **OP.** **Ox-ac.** parathyr. **PHOS.** plb-xyz. **Plb.** **Podo.** **Puls.** pyrog. rham-cal. rham-cath. **RHUS-T.** ric. sabin. **Samb.** sang. santin. **Sec.** **Sep.** **Sil.** spong. squil. **Stram.** **Sulph.** syph. **TER.** **THUJ.** tub-d. tub-r. tub. uran-met. **Uran-n.** urt-u. verat-v. **Verat.** vip.

WEGENER'S GRANULOMATOSIS

It is a form of vasculitis that affects the nose, lungs, kidneys and other organs. It is also called as granulomatosis with polyangiitis (GPA). (Psora/ Syphilis)

Remedies- acon. agar. **All-c.** aml-ns. ant-c. **Ant-t.** apis arist-cl. **Arn.** **Ars.** **Bapt.** bell-p-sp. bell-p. **Bell.** both. **BRY.** **Bufo** calc-ar. **Calc-f.** **CALC.** **CARB-V.** carbn-s. card-m. **Cham.** **Chin.** chlam-tr. chlorpr. **Crot-h.** eberth. **Echi.** **Ferr-p.** ferr. **Fl-ac.** gels. glon. graph. **Ham.** hecla hep. **Hippoz.** hir. hist. **Hyos.** influ. ins. **Iod.** **Kali-c.** kali-chl. **Kali-i.** kali-m. kreos. **LACH.** **Led.** **Lyc.** **Lycps-v.** mag-c. mag-f. merc-cy. merc-i-r. merc. morg-p. **Mur-ac.** **Nat-i.** nat-m. **Nat-s.** nux-v. parathyr. **Phos.** prot. **PULS.** rhod. **RHUS-T.** sacch. sang. sec. sep. **Sil.** spig. streptoc. stront-br. stront-c. sul-ac. sulfa. **Sulph.** thiop. **Thuj.** tril-p. verat. vip-a. **VIP.** zinc.

CHURG-STRAUSS SYNDROME

It is a type of autoimmune vasculitis that affects cells in the blood vessels of the lungs, gastrointestinal system, skin, and nerves. (Psora/ Syphilis)

Remedies- acon. aml-ns. apis **arn.** **Bell.** bell-p. bell-p-sp. **CARB-V.** card-m. chlam-tr. ferr. **Fl-ac.** gels. glon. **Ham.** **Hyos.** influ. ins. **Lach.** lyc. nat-m. **Phos.** **PULS.** sacch. sang. sec. sep. sul-ac. sulph. **Thuj.** tril-p. vip. zinc.

MICROSCOPIC POLYANGIITIS

Microscopic polyangiitis is an ill-defined autoimmune disease characterized by a systemic, pauci-immune, necrotizing, small-vessel vasculitis without clinical or pathological evidence of necrotizing granulomatous inflammation. (Psora/ Sycosis)

Remedies- **bell.** caust. **Cupr.** **Fl-ac.** hyper. kali-br. lach. phos. sul-ac.

POLYMYOSITIS/DERMATOMYOSITIS

It is a disease characterized by inflammation and degeneration of the muscles. When the condition also affects the skin, it is called dermatomyositis. (Psora/ Syphilis)

Remedies- **Arn.** **bell.** **Bry.** cemic. ham. hep. kali-i. lat-m. merc. **Mez.** **Rhus-t.** streptoc. thuj. toxo-g.

OSTEOGENESIS IMPERFECTA

Caused by a mutation in type 1 collagen, dominant autosomal disorder, results in weak bones and irregular connective tissue, can be mild or lethal, mild cases have lowered levels of collagen type 1 while severe cases have structural defects in collagen. (Psora/ Syphilis)

Remedies- [p-benzq.](#)

CHONDRODYSPLASIAS

Chondrodysplasia punctata is a heterogeneous group of bone dysplasias, the common characteristic of which is stippling of the epiphyses in infancy (Syphilis). The group includes a severe autosomal recessive form (rhizomelic dwarfism), an autosomal dominant form (Conradi-Hünermann syndrome), and a milder X-linked form. This skeletal disorder is caused by a mutation in type 2 collagen.

Remedies- [calc-phos](#)

EHLER-DANLOS SYNDROME

The Ehlers-Danlos syndromes (EDS) refer to a group of inherited disorders that affect collagen structure and function. Genetic abnormalities in the manufacturing of collagen within the body affect connective tissues, causing them to be abnormally weak (Psora/ Syphilis). Ten different types of this disorder which lead to deformities in connective tissue, some can be lethal that lead to the rupture of arteries, each syndrome is caused by a different mutation, for example type four of this disorder is caused by a mutation in collagen type 3.

Remedies- [bar-c.](#) [bar-m.](#) [vanad.](#)

ALPORT SYNDROME

It is a hereditary disease of the kidneys that primarily affects men, causing blood in the urine, hearing loss and eye problems. Eventually, kidney dialysis or transplant may be necessary. It can be passed on genetically, both an autosomal dominant and autosomal recessive disorder. (Psora/ Sycosis/ Syphilis)

Remedies- [ter.](#) [thuj.](#) [Viol-o.](#)

OSTEOPOROSIS

It occurs when bones lose an excessive amount of their protein and mineral content, particularly calcium. It is not inherited genetically, brought on with age, associated with reduced levels of collagen in the skin and bones. (Psora/ Syphilis)

Remedies- [arg-met.](#) [bacls-7.](#) [calc-f.](#) [cortico.](#) [cortiso.](#) [dys.](#) [fl-ac.](#) [morg-p.](#) [palo.](#)

KNOBLOCH SYNDROME

Knobloch syndrome (KS) is defined by vitreoretinal and macular degeneration, and occipital encephalocele and is caused by a mutation in the collagen XVIII gene. The patients present with protrusion of the brain tissue and degeneration of the retina, an individual with family members suffering from the disorder are at an increased risk. (Sycosis/ Syphilis)

Remedies- [acon.](#) [agar.](#) [Ars.](#) [asaf.](#) [aur-s.](#) [aur.](#) [Bell.](#) [BRY.](#) [Cedr.](#) [cina](#) [Coloc.](#) [crot-h.](#) [dig.](#) [Dub.](#) [ferr-p.](#) [Gels.](#) [ham.](#) [Hep.](#) [iod.](#) [Ip.](#) [jab.](#) [Kali-chl.](#) [Kali-i.](#) [kali-m.](#) [kalm.](#) [lach.](#) [lith-c.](#) [Merc-c.](#) [Merc-d.](#) [merc-i-r.](#) [Merc.](#) [naphtin.](#) [Nux-v.](#) [p-benzq.](#) [phos.](#) [Phyt.](#) [Pilo.](#) [plb.](#) [Prun.](#) [psor.](#) [puls.](#) [Rhus-t.](#) [ruta](#) [santin.](#) [Sil.](#) [Spig.](#) [sulph.](#) [syph.](#) [tab.](#) [tell.](#) [Thuj.](#) [tub.](#) [verat-v.](#) [viol-o.](#)

SCURVY

It results from a deficiency of vitamin C, which is required for the synthesis of collagen in humans. Symptoms include malaise, lethargy, skin changes with roughness, easy bruising and petechiae, gum disease, loosening of teeth, poor wound healing, and emotional changes. (Psora/ Causa occasionalis)

Remedies- acet-ac. agav-a. agn. all-s. aln. alum. alumn. **Am-c.** am-m. ambr. ant-c. aran. arg-met. **Ars.** ars-i. arum-m. aur. bell. borx. bov. brass. brass-n-o. bry. **Calc.** canth. caps. **Carb-an.** **CARB-V.** cary. caust. cetr. chin. chinin-s. cic. **Cist.** cit-ac. cit-l. cit-v. coca coch. con. **Dulc.** elat. **Ferr-p.** gali. graph. **Ham.** **Hep.** **Iod.** jug-r. **Kali-c.** kali-chl. **Kali-m.** kali-n. kali-p. kreos. lach. lyc. mag-m. **MERC.** **MUR-AC.** nat-hchls. **Nat-m.** **Nit-ac.** nit-m-ac. nux-m. **NUX-V.** petr. ph-ac. phos. plb. psor. rat. rhus-t. ruta sabin. sacch. sanic. sep. **Sil.** sin-n. sol-t-ae. stann. **STAPH.** sul-ac. **Sulph.** tart-ac. tep. **Urin.** zinc.

TREATMENT

It is intended to increase collagen production, decrease its breakdown and controlling aging. The growth of collagen, elastin, and melanin can all be stimulated through laser therapy, involving intense wavelengths of light.

The nutrients that may support collagen formation include-

- **Proline**
 - found in egg whites, meat, cheese, soy and cabbage
- **Anthocyanidins**
 - found in blackberries, blueberries, cherries and raspberries
- **Vitamin C**
 - found in oranges, strawberries, peppers and broccoli
- **Copper**
 - can be found in shellfish, nuts, red meat and some drinking water
- **Vitamin A**
 - found in animal-derived foods and in plant foods as beta-carotene.

MEDICAL USES OF COLLAGEN

Collagen that is used medically can originate from human, bovine, porcine and ovine sources.

SKIN FILLERS

Collagen injections can be used in cosmetic procedures to improve the contours of aging skin.

WOUND DRESSING

Within wound healing, collagen attracts new skin cells to the wound site, promotes healing and provides a platform for the growth of new tissue.

GUIDED TISSUE REGENERATION

Collagen-based membranes have been used in periodontal and implant therapy to promote the growth of specific types of cell.

VASCULAR PROSTHETICS

Collagen tissue grafts from donors have been used in peripheral nerve regeneration and vascular prostheses, used in arterial reconstruction.

TREATMENT OF OSTEOARTHRITIS

Collagen supplements or formulations may be beneficial in the treatment of osteoarthritis.

SKIN REVITALIZATION

Many products containing collagen, including creams and powders, claim to revitalize the skin.

HOMOEOPATHIC REMEDIES FOR COLLAGEN DISORDERS

acet-ac. am-caust. anan. arg-met. ars-i. ars. calen. carb-v. carc. cortiso. crot-h. cyclop. cyclosp. des-ac. germ-met. graph. kali-ar. lach. med. merc. mur-ac. nit-ac. penic. phos. plut-n. psor. rhus-t. saroth. stann. suis-chord-umb. sulph. syph. thuj. tub-r. tub. uncar-tom. urin.

BIBLIOGRAPHY



Chapter 33. Diagnosis of Medical Renal Diseases > Renal Involvement in Collagen Diseases Smith and Tanagho's General Urology, 18e ... Although it may not be accurate to classify all of these disorders as collagen diseases, systemic lupus erythematosus, polyarteritis nodosa, microscopic angiitis, scleroderma, Wegener's granulomatosis, Henoch–Schönlein purpura, and thrombotic thrombocytopenic purpura have been implicated...



Chapter 53. Epidermal and Epidermal–Dermal Adhesion > Collagen IV Fitzpatrick's Dermatology in General Medicine, 8e ... Figure 53-6 Images of basement membrane molecules visualized by rotary shadowing. A. Collagen IV monomer and a dimer resulting from aggregation of C-terminal NC-1 domains. B. Collagen IV tetramer ("spider") demonstrating the 7-S domain with the four protruding molecules...



Chapter 55. Nonatherosclerotic Coronary Heart Disease > Collagen Vascular Disease Vasculitis Hurst's The Heart, 13e ... Collagen vascular diseases generally involve arthritis, myositis, carditis, dermatitis, and inflammatory vascular changes to varying degrees. 253 They include systemic lupus erythematosus, rheumatoid vasculitis, systemic sclerosis, and polymyositis. Rheumatoid vasculitis is discussed under...



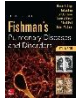
Chapter 63. Collagens, Elastic Fibers, and Other Extracellular Matrix Proteins of the Dermis > Cutaneous Collagen Diseases Fitzpatrick's Dermatology in General Medicine, 8e ... The term collagen disease implies that a clinical condition involves an abnormality in the structure, synthesis, or degradation of collagens. This term is frequently used to characterize a clinically heterogeneous group of inflammatory diseases, including lupus erythematosus, scleroderma...



Chapter 63. Collagens, Elastic Fibers, and Other Extracellular Matrix Proteins of the Dermis > Genetic Heterogeneity of Collagens Fitzpatrick's Dermatology in General Medicine, 8e.... 17 Although skin disorders associated with genetic mutations in type IV collagens have not been described, mutation in the COL4A1 gene has been identified in a family with autosomal dominant porencephaly and infantile hemiparesis, 22 and mutations in the COL4A5 gene result in Alport syndrome...



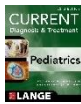
Connective Tissue > Collagen Junqueira's Basic Histology, 14e ... TABLE 5–4 Examples of clinical disorders resulting from defects in collagen synthesis. Disorder Defect Symptoms Ehlers-Danlos type IV Faulty transcription or translation of collagen type III Aortic and/or intestinal rupture Ehlers-Danlos type VI...



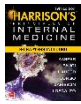
Depositional Diseases of the Lungs > Collagen Vascular Disease and Immune Complex–Associated Pulmonary Hemorrhage Fishman's Pulmonary Diseases and Disorders, 5e... of these disorders are consistently associated with pulmonary hemorrhage in SLE. Early diagnosis and treatment with corticosteroids and cytotoxic drugs are associated with favorable outcomes, although relapse is not uncommon. ...



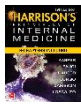
Encyclopedia Homoeopathica



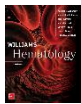
Hematologic Disorders > 2. Collagen Disorders CURRENT Diagnosis & Treatment: Pediatrics, 22e ... Mild to life-threatening bleeding occurs with some types of Ehlers-Danlos syndrome, the most common inherited collagen disorder. Ehlers-Danlos syndrome is characterized by joint hypermobility, skin extensibility, and easy bruising. Coagulation abnormalities may sometimes be present, including...



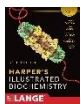
Heritable Disorders of Connective Tissue > OTHER COLLAGENS AND RELATED MOLECULES Harrison's Principles of Internal Medicine ... The unique properties of the triple helix are used to define a family of at least 28 collagens that contain repetitive -Gly-X-Y- sequences and form triple helices of varying length and complexity. The proteins are heterogeneous both in structure and function, and many are the sites of mutations...



Heritable Disorders of Connective Tissue > Structure and Biosynthesis of Fibrillar Collagens Harrison's Principles of Internal Medicine ... FIGURE 427-1 Schematic summary of biosynthesis of fibrillar collagens. (Modified and reproduced with permission from J Myllyharju, KI Kivirikko: Trends in Genetics 20:33, 2004.) The tensile strength of collagen fibers derives primarily from the self-assembly of protein...



Platelet Morphology, Biochemistry, and Function > Collagen: GPVI and Integrin $\alpha 2 \beta 1$ Williams Hematology, 9e... kinase in platelets, its role in platelet signaling is unclear, as mice lacking Src do not suffer from any obvious bleeding disorder. 1605 Syk, on the other hand, appears to play a critical role in collagen activation of platelets as platelets from mice lacking Syk do not aggregate or undergo...

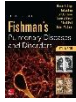


Proteins: Higher Orders of Structure > Nutritional & Genetic Disorders Can Impair Collagen Maturation Harper's Illustrated Biochemistry, 30e ..., reflects a dietary deficiency of the copper required by lysyl oxidase, which catalyzes a key step in the formation of the covalent cross-links that strengthen collagen fibers. Genetic disorders of collagen biosynthesis include several forms of osteogenesis imperfecta, characterized by fragile bones...



Pulmonary Arterial Hypertension > Collagen Vascular Diseases Fishman's Pulmonary Diseases and Disorders, 5e... obtained without confirmation by catheterization in patients with mixed connective tissue disease. Regardless of frequency,

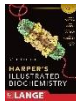
however, when it is present, PAH appears to be a significant cause of death in these patients. PAH occurs in numerous other rheumatologic disorders, including Sjögren's syndrome...



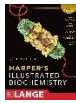
Pulmonary Vasculitis > Systemic Lupus Erythematosus and Other Collagen Vascular Disorders Fishman's Pulmonary Diseases and Disorders, 5e ... in SLE varies widely, between 0% and 90%. Treatment consists of glucocorticoids and cyclophosphamide. 39 The use of plasma exchange has been suggested, but its benefit remains unproved. Respiratory complications are very common in all other types of collagen vascular or connective tissue disorders...



Radar 10



The Extracellular Matrix > A Number of Genetic & Deficiency Diseases Result From Abnormalities in the Synthesis of Collagen Harper's Illustrated Biochemistry, 30e ... modifications. Diseases affecting bone (eg, osteogenesis imperfecta) and cartilage (eg, the chondrodysplasias) will be discussed later in this chapter. Ehlers-Danlos syndrome (formerly called Cutis hyperelastica), comprises a group of inherited disorders whose principal clinical features...



The Extracellular Matrix > CHONDRODYSPLASIAS ARE CAUSED BY MUTATIONS IN GENES ENCODING TYPE II COLLAGEN & FIBROBLAST GROWTH FACTOR RECEPTORS Harper's Illustrated Biochemistry, 30e.... Chondrodysplasias are a mixed group of hereditary disorders affecting cartilage. They are manifested by short-limbed dwarfism and numerous skeletal deformities. A number of them are due to a variety of mutations in the COL2A1 gene, leading to abnormal forms of type II collagen. One example is the Stickler...