

Scientific Program
18th Workshop on Vitamin D



April 21 – 24, 2015
Delft, NL

Front Cover Images

Main Molecular Image: Not surprisingly, the molecular model describes the three dimensional shape of the steroid hormone, $1\alpha,25$ -dihydroxy vitamin D_3 that binds selectively and tightly to its cognate protein receptor, the vitamin D receptor (VDR). Thanks are due to Bill Okamura who is a Professor of Organic Chemistry in the Chemistry Department at the University of California. He spent significant time evaluating and validating the 3D image of all the bonds of the of $1\alpha,25(OH)_2D_3$ on the front of the cover. The two-dimensional structure (lower right) is $1\alpha,25(OH)_2D_3$. The fine lines connect each atom in the two-dimensional view with the same atom in the 3D model.

Histogram: The histogram reports the number of papers published and listed in the National Library of Medicine that included the term 'vitamin D' in either the Title or the Abstract from 1950 - 2013. In the past 53 years 37,596 papers were published. In the past three years close to 12,000 new papers were published on vitamin D (3662 in 2012, 3826 in 2013 and 4355 in 2014).

Image of Man: The image is known as the **Vitruvian Man**.



The Vitruvian Man is a world-renowned drawing created by Leonardo da Vinci in about 1487. It is accompanied by notes based on the work of the famed architect, Vitruvius. The drawing, which is in pen and ink on paper, depicts a male figure in two superimposed positions with his arms and legs apart and simultaneously inscribed in a circle and square. The drawing and text are sometimes called the Canon of Proportions. It is stored in the Gallerie dell'Accademia in Venice, Italy.

The drawing is based on the correlations of ideal human proportions with geometry described by the ancient Roman architect Vitruvius in Book III of his treatise *De Architectura*. Vitruvius described the human figure as being the principal source of proportion among the classical orders of architecture. Leonardo's drawing is traditionally named in honor of the architect. (Abstracted from Wikipedia)

The front cover was designed by Sohail Wasif, in Computing and Communications at the University of California, Riverside.

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Official Sponsors

Major funding for the Vitamin D Workshops is provided by the National Institute on Aging ¹



The generous support of the World Health Organization for Sessions VI and VII is acknowledged



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Roger Bouillon
Renate de Jongh
Natasja van Schoor

Ab-Initio

Inge van Marion
Lucienne Dado

Meetings Plus

Roxanne Hall

In Memorium - Dr. Ricardo Boland



The Vitamin D Workshop is saddened to announce the death of Argentinean scientist Dr. Ricardo Boland. Dr. Boland was a valued member of the Program Advisory Committee of the Vitamin D Workshop and was actively involved in reviewing manuscripts for the 17th Workshop Proceedings at the time of his death. He was also a member of ASBMR, the Endocrine Society, the Argentinean Society of Biochemistry, and the Argentinean Society of Bone and Mineral Research, so he was well known by many of us in the Vitamin D field. Dr. Boland trained in Germany and the US, and together with his colleague and wife of 40 years, Dr. Ana Russo de Boland, mentored an extensive cadre of Argentinean scientists at the Universidad Nacional del Sur (UNS), Bahia Blanca, Argentina.

Ricardo was a principal investigator of the Argentina Research Council and played a crucial role in establishing the Department of Biochemistry and Biology at UNS, which he directed in the 1980s, and the recently established Institute of Biological and Biomedical Sciences of the South.

A number of sabbatical stays ranging from 3 to 9 months by Dr. Boland from Bahia Blanca, occurred in the laboratory of professor, Anthony Norman in the Department of Biochemistry at the University of California in Riverside, CA. Ricardo's visits occurred in 1985, 1990, 1994 and 2000. On all but two visits by Ricardo, he brought his wife Dr. Ana Russo Boland who also worked in the laboratory. On two of the sabbaticals Ricardo and Anna brought their two children who attended school in Riverside. It was a lovely family to introduce to the city of Riverside.

Ricardo attended early Vitamin D Workshops. His first participation was at the 5th Workshop in February 1982 which was held in Williamsburg, Virginia. The title of his submitted paper was "The Effects of Cholecalciferol on Proteins and Lipids of Muscle Membranes". Since that first meeting, Ricardo attended every Workshop up to the 17th Workshop (his last) which was held in Chicago. In addition to his more recent work on vitamin D and muscle, one of the surprising discoveries for the vitamin D research field made by Ricardo, was that some plants have inherited the capability of producing some 1,25-(OH)₂D₃. One example is *Solanum Glaucophyllum*.

We will miss Ricardo's constantly inquisitive mind, and his contributions to the intellectual life of the Workshop.



Dr. Ricardo Boland with Dr. David Feldman and Dr. Antonio Mourino at the 17th Workshop on Vitamin D, Chicago, 2014

Young Investigator and Trainee Travel Awards

Young Investigator

Karl P. Schlingmann
University Children`s Hospital, Wilhelm`s University Muenster, Germany

Trainees

Mohamed Abu el Maaty
Ruprecht-Karls-Universität Heidelberg, Germany

Gabriela Bomfim Ferreira
KU LEUVEN, Belgium

Wendy Dankers
Erasmus MC University Medical Center, The Netherlands

Martin Kaufmann
Queen's University, Canada

Gilles Laverny
IGBMC, University of Strasbourg, France

Seong Min Lee
University of Wisconsin-Madison, USA

Giovanni Lugli
University of Illinois at Chicago, USA

Donald Matthews
University at Albany Cancer Research Center, USA

Janna Nissen
Technical University of Denmark, Denmark

Lige Song
Massachusetts General Hospital, Boston, USA and
Tongji University School of Medicine, Shanghai, Japan

Hillary St. John
University of Wisconsin-Madison, USA

Awards for junior scientists were made possible by funds from Heartland Assays, LLC (Ames, Iowa) and a conference grant from the National Institutes of Health.

General Information

Welcoming Reception, Tuesday, April 21, 2015

Please join us for a Welcoming Reception Tuesday evening from 5:00 – 7:00 pm at the Theatre de Veste. All delegates and their registered accompanying guests are cordially invited.

Poster Sessions, Wednesday – Friday, April 22 – 24, 2015

There will be three poster sessions during the Workshop. The poster sessions will be held at the Theatre de Veste each afternoon during the lunch period. Please follow the signage to access the poster area adjacent to the main auditorium.

Mount: The morning of your assigned session.

Dismount: Any time after the afternoon coffee break. All posters must be removed by the end of the meeting close for your assigned day.

Breaks and Social Events

Lunches: On Wednesday, Thursday and Friday, lunches are included in the registration fee. The lunches will be available each day in the Moodz Restaurant and lobby area.

Coffee Breaks: All registered Delegates are invited to stretch and enjoy a cup of coffee in the lobby area during the twice-daily coffee breaks.

Networking Social Event: Thursday, April 23rd: A networking social event with buffet dinner will be held at the Museum Het Prinsenhof from 7:00 – 11:00 pm. Additional registration and fee is required. A cash bar will be available. Please inquire at the Registration desk upon check-in if you wish to attend.

Scientific Program
18th Workshop on Vitamin D



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Scientific Program – Tuesday and Wednesday
18th WORKSHOP ON VITAMIN D

TUESDAY, April 21, 2015

17:00 - 19:00 Welcome Reception at the Theatre de Veste

WEDNESDAY, APRIL 22, 2015

8:30 - 8:45 **Welcome and Opening Remarks**
Paul Lips, Program Chair

Session I: MOLECULAR GENETICS AND VITAMIN D ACTION
Session Chair: Carsten Carlberg, Co-Chair: J. Wesley Pike

8:45 - 8:50 Chair's Introduction

8:50 - 9:15 A. Uitterlinden THE SEARCH FOR BONE AND JOINT GENES AND WHAT TO DO
9:15 - 9:20 *Discussion* WITH THEM?

9:20 - 9:45 R. Bouillon THE VITAMIN D BINDING PROTEIN, DBP: AN UPDATE ON A
9:45 - 9:50 *Discussion* MULTIFUNCTIONAL PROTEIN

9:50 - 10:00 R. Scragg CONSISTENT ETHNIC SPECIFIC DIFFERENCES IN DIABETES RISK
10:00 - 10:05 *Discussion* AND VITAMIN D STATUS IN THE NATIONAL HEALTH AND
NUTRITION EXAMINATION SURVEYS

10:05 - 10:15 S. Seuter SHORT- AND LONG-TERM EPIGENOMIC AND TRANSCRIPTOMIC
10:15 - 10:20 *Discussion* RESPONSE OF A HUMAN MONOCYTIC CELL MODEL TO 1,25-
DIHYDROXYVITAMIN D₃

10:20 - 10:30 S.M. Lee A SERIES OF HIGHLY DISPERSED INTRONIC AND DISTAL
10:30 - 10:35 *Discussion* ENHANCERS CONTROLS BASAL, TISSUE-SPECIFIC AND
INDUCIBLE EXPRESSION OF THE VITAMIN D RECEPTOR GENE
BOTH IN VITRO AND IN MICE IN VIVO

10:35 - 11:00 COFFEE BREAK

Session II: VITAMIN D METABOLISM AND CALCIUM ABSORPTION

Session Chair: Dan Bikle, Co-Chair: John White

11:00 - 11:05 Chair's Introduction

11:05 - 11:30 V. Tangpricha VITAMIN D THERAPY IN CYSTIC FIBROSIS
11:30 - 11:35 *Discussion*

11:35 - 11:45 Y. Ono ACTIVE VITAMIN D₃ ANALOG, ELDECALCITOL: PROTEIN
11:45 - 11:50 *Discussion* INTERACTION AND MODE OF ACTION

11:50 - 12:00 M. Kaufmann SIMULTANEOUS ASSAY OF MULTIPLE VITAMIN D METABOLITES
12:00 - 12:05 *Discussion* BY LC-MS/MS FOR THE SCREENING OF PATIENTS WITH
HYPERCALCEMIA & CYP24A1 MUTATIONS. A COHORT STUDY

12:05 - 13:30 **LUNCH AND POSTER SESSION I VIEWING**

Session III:**RENAL PHYSIOLOGY AND DISEASES**

Session Chair: Michael Kimlin, Co-Chair: Renate de Jongh

13:30 - 13:35	Chair's Introduction	
13:35 - 14:00	R. Erben	VITAMIN D, FGF23 AND CALCIUM CHANNELS
14:00 - 14:05	<i>Discussion</i>	
14:05 - 14:30	M. Vervloet	FIBROBLAST GROWTH FACTOR 23 (FGF23) AND VITAMIN D IN
14:30 - 14:35	<i>Discussion</i>	CHRONIC RENAL FAILURE
14:35 - 14:45	K. Schlingmann	NEPHROLITHIASIS CAUSED BY MUTATIONS IN CYP24A1
14:45 - 14:50	<i>Discussion</i>	
14:50 - 15:00	S. Strugnell	MODIFIED-RELEASE CALCIFEDIOL (MRC) CAPSULES INCREASE
15:00 - 15:05	<i>Discussion</i>	25D AND 1,25D AND LOWER iPTH INDEPENDENT OF eGFR IN CHRONIC KIDNEY DISEASE PATIENTS WITHOUT IMPACTING SERUM CALCIUM AND PHOSPHORUS
15:05 - 15:30	COFFEE BREAK	

Session IV:**VITAMIN D AND CANCER**

Session Chair: JoEllen Welsh, Co-Chair: George Studzinski

15:30 - 15:35	Chair's Introduction	
15:35 - 16:00	M. van Driel	VITAMIN D IN BONE METASTATIC CANCER MODELS: POSSIBLE
16:00 - 16:05	<i>Discussion</i>	THERAPEUTIC AGENT
16:05 - 16:15	E. Kallay	IMPACT OF CYP24A1 OVEREXPRESSION ON GROWTH OF
16:15 - 16:20	<i>Discussion</i>	COLORECTAL TUMOURS
16:20 - 16:30	M. Tenniswood	MODULATION OF ENERGY METABOLISM BY VITAMIN D IN
16:30 - 16:35	<i>Discussion</i>	PROSTATE CANCER
16:35 - 16:45	G. Lugli	SUPPRESSION OF microRNAs MAY BE A DRIVER OF PROSTATE
16:45 - 16:50	<i>Discussion</i>	CARCINOGENESIS WHICH IS REVERSIBLE BY 1,25- DIHYDROXYVITAMIN D

Session V:**MEASUREMENT OF VITAMIN D METABOLITES**

Session Chair: Helen Henry, Co-Chair: Miguel Maestro

16:50 - 16:55	Chair's Introduction	
16:55 - 17:20	G. Jones	VITAMIN D METABOLIC PROFILING USING LIQUID
17:20 - 17:25	<i>Discussion</i>	CHROMATOGRAPHY-TANDEM MASS SPECTROMETRY (LC-MS/MS)
17:25 - 17:50	C. Sempos	STANDARDIZING VITAMIN D ASSAYS: IMPORTANCE TO
17:50 - 17:55	<i>Discussion</i>	RESEARCH
17:55 - 18:05	A. Valcour	A NOVEL, FULLY-AUTOMATED CHEMILUMINESCENT ASSAY FOR
18:05 - 18:10	<i>Discussion</i>	THE DETECTION OF 1,25-DIHYDROXYVITAMIN D IN BIOLOGICAL SAMPLES
18:10 - 18:20	A. Heijboer	DETERMINATION OF REFERENCE VALUES FOR SERUM TOTAL
18:20 - 18:25	<i>Discussion</i>	1,25-DIHYDROXYVITAMIN D ₃ USING A 2D ID-UPLC-MS/MS METHOD

Scientific Program – Thursday
18th WORKSHOP ON VITAMIN D

Sessions VI and VII Sponsored by World Health Organization

8:30 - 8:45 Introduction to WHO Sessions
J. P. Peña-Rosas

Session VI: PREVALENCE, DIAGNOSIS AND PREVENTION OF RICKETS
Session Chair: Howard Morris, Co-Chair: Inez Schoenmakers

8:45 - 8:50 Chair's Introduction

8:50 - 9:15 J. Pettifor SCREENING OF COMMUNITIES FOR VITAMIN D DEFICIENCY
9:15 - 9:20 *Discussion* RICKETS

9:20 - 9:45 N. Shaw PREVENTION AND TREATMENT OF RICKETS AND
9:45 - 9:50 *Discussion* RECOMMENDATIONS ON VITAMIN D

9:50 - 10:20 COFFEE BREAK

Session VII: VITAMIN D DEFICIENCY DURING PREGNANCY
Session Chair: Bruce Hollis, Co-Chair: John McGrath

10:20 - 10:25 Chair's Introduction

10:25 - 10:50 C. Palacios VITAMIN D SUPPLEMENTATION IN PREGNANCY
10:50 - 10:55 *Discussion*

10:55 - 11:20 M. Tabesh MATERNAL VITAMIN D STATUS AND RISK OF PRE-ECLAMPSIA: A
11:20 - 11:25 *Discussion* SYSTEMIC REVIEW AND META-ANALYSIS

11:25 - 11:50 C. Cooper MATERNAL VITAMIN D STATUS AND PRE- AND POSTNATAL BONE
11:50 - 11:55 *Discussion* DEVELOPMENT IN THE CHILD

11:55 - 12:55 WHO Round Table Discussion
Session Chairs: Roger Bouillon and Inez Schoenmakers

TRANSLATING RESEARCH INTO EVIDENCE-INFORMED POLICY OPTIONS TO ADDRESS
VITAMIN D NUTRITION

Introductions: J.P. Peña-Rosas, C. Lamberg-Allardt, J. Pettifor

Additional Panel Members: F. Glorieux and N. Shaw

12:55 - 14:30 **LUNCH AND POSTER SESSION II VIEWING**

Session VIII: VITAMIN D NUTRITION AND SUPPLEMENTATION
Session Chair: Christel Lamberg-Allardt, Co-Chair: Susan Whiting

14:30 - 14:35 Chair's Introduction

14:35 - 15:00 M. Kiely MODELLING OF VITAMIN D INTAKE AND EFFECTS OF FOOD
15:00 - 15:05 *Discussion* FORTIFICATION

15:05 - 15:15 S. Whiting MATERNAL VITAMIN D SUPPLEMENTATION AT 50 mcg PER DAY
15:15 - 15:20 *Discussion* PROTECTS AGAINST LOW SERUM 25-HYDROXYVITAMIN D
[25OHD] IN INFANTS AT 8 WEEKS OF AGE: A RANDOMIZED
CONTROLLED TRIAL OF THREE DOSES OF VITAMIN D BEGINNING
IN GESTATION AND CONTINUED IN LACTATION

15:20 - 15:30	C. Carlberg	TRANSCRIPTOMIC AND EPIGENOMIC RESPONSE OF WHITE
15:30 - 15:35	<i>Discussion</i>	BLOOD CELLS OF VITAMIN D ₃ -SUPPLEMENTED HUMAN SUBJECTS <i>IN VIVO</i>
15:35 - 16:00	COFFEE BREAK	
Session IX:	VITAMIN D AND IMMUNOLOGY	
	Session Chair: Margherita Cantorna, Co-Chair: Martin Hewison	
16:00 - 16:05	Chair's Introduction	
16:05 - 16:30	C. Mathieu	VITAMIN D AND TYPE 1 DIABETES
16:30 - 16:35	<i>Discussion</i>	
16:35 - 17:00	A. Martineau	VITAMIN D AND INFECTIOUS DISEASES
17:00 - 17:05	<i>Discussion</i>	
17:05 - 17:15	G.B. Ferreira	1 α ,25-DIHYDROXYVITAMIN D ₃ INDUCES TOLERANCE IN HUMAN
17:15 - 17:20	<i>Discussion</i>	DENDRITIC CELLS BY ACTIVATION OF INTRACELLULAR METABOLIC PATHWAYS
17:20 - 17:30	W. Dankers	1,25(OH) ₂ D ₃ SUPPRESSES THE PRO-INFLAMMATORY TH17-RASF
17:30 - 17:35	<i>Discussion</i>	FEEDBACK LOOP VIA IL-4-DEPENDENT AND -INDEPENDENT MECHANISMS
17:35 - 17:45	D. Bikle	VITAMIN D AND CALCIUM REGULATION OF WOUND HEALING
17:45 - 17:50	<i>Discussion</i>	
17:50 - 18:00	L. Song	THE VITAMIN D RECEPTOR REGULATES TISSUE RESIDENT
18:00 - 18:05	<i>Discussion</i>	MACROPHAGE PROLIFERATION DURING CUTANEOUS WOUND HEALING
18:05 - 18:30	RECOGNITION OF WORKSHOP AWARD RECIPIENTS	
19:00 - 23:00	NETWORKING EVENT "PRINSENHOF" INCLUDING BUFFET DINNER	

Scientific Program – Friday
18th WORKSHOP ON VITAMIN D

Session X: SELECTED ORAL PRESENTATIONS AND LATE BREAKING NEWS

Session Chair: JoEllen Welsh, Co-Chair: Heike Bischoff-Ferrari

9:00 - 9:10 9:10 - 9:15	E. de Koning <i>Discussion</i>	SERUM 25-HYDROXYVITAMIN D, PARATHYROID HORMONE AND THE RISK OF OVERALL AND DISEASE-SPECIFIC MORTALITY: RESULTS FROM THE LONGITUDINAL AGING STUDY AMSTERDAM
9:15 - 9:25 9:25 - 9:30	D. Eyles <i>Discussion</i>	1,25α(OH)2D3 PREVENTS AUTISM-RELATED PHENOTYPES IN A MATERNAL IMMUNE ACTIVATION ANIMAL MODEL
9:30 - 9:40 9:40 - 9:45	S. Borg <i>Discussion</i>	MATERNAL VITAMIN D DEFICIENCY ALTERS BONE SIZE AND LATER SKELETAL RESPONSIVENESS TO MECHANICAL LOADING IN A MODEL SYSTEM (Abstract: Page 74)
9:45 - 9:55 9:55 - 10:00	A. Vaes <i>Discussion</i>	RELATIVE IMPORTANCE OF SUMMER SUN EXPOSURE, VITAMIN D INTAKE AND GENES TO VITAMIN D STATUS IN DUTCH OLDER ADULTS (Abstract: Page 114)

Session XI: VITAMIN D AND ITS RECEPTOR: MOLECULAR MECHANISMS

Session Chair: Hans van Leeuwen, Co-Chair: Anthony Norman

10:00 - 10:05	Chair's Introduction	
10:05 - 10:30 10:30 - 10:35	M. Meyer <i>Discussion</i>	DYNAMIC VDR CONTROL OF GENE EXPRESSION DURING DIFFERENTIATION AND SELECTIVE REGULATION OF <i>MMP13</i> TRANSCRIPTION
10:35 - 10:45 10:45 - 10:50	D. Matthews <i>Discussion</i>	ADIPOSE-SPECIFIC VDR DELETION ALTERS BODY FAT AND ENHANCES MAMMARY EPITHELIAL DENSITY
10:50 - 11:00 11:00 - 11:05	D. Glenn <i>Discussion</i>	AMPLIFICATION OF LIPOTOXIC CARDIOMYOPATHY IN VDR KNOCKOUT MOUSE
11:05 - 11:30	COFFEE BREAK	

Session XII: VITAMIN D, MUSCLE AND CARDIOVASCULAR SYSTEM

Session Chair: Peter Ebeling, Co-Chair: Natasja van Schoor

11:30 - 11:35	Chair's Introduction	
11:35 - 12:00 12:00 - 12:05	R. Brandes <i>Discussion</i>	VITAMIN D PROMOTES VASCULAR REGENERATION
12:05 - 12:30 12:30 - 12:35	H. Bischoff-Ferrari <i>Discussion</i>	EFFECT OF HIGH-DOSE VITAMIN D ON FALL PREVENTION
12:35 - 12:45 12:45 - 12:50	D. Agrawal <i>Discussion</i>	VITAMIN D STATUS DETERMINES INTIMAL HYPERPLASIA AND RESTENOSIS FOLLOWING CORONARY INTERVENTION
12:50 - 13:00 13:00 - 13:05	C. Bernal-Mizrachi <i>Discussion</i>	ABSENCE OF MACROPHAGE VITAMIN D RECEPTOR ACCELERATES MONOCYTE CHOLESTEROL TRANSPORT INTO THE ATHEROSCLEROTIC PLAQUE IN MICE
13:05 - 14:30	LUNCH AND POSTER SESSION III VIEWING	

Session XIII:

VITAMIN D AND BONE

Session Chair: Marie Demay, Co-Chair: Geert Carmeliet

14:30 - 14:35	Chair's Introduction	
14:35 - 15:00 15:00 - 15:05	P. Anderson <i>Discussion</i>	LOCAL SYNTHESIS OF $1\alpha,25(\text{OH})_2\text{D}_3$ <i>IN VIVO</i> IS REQUIRED TO PROMOTE BONE FORMATION AND IS SUBSTRATE DEPENDENT
15:05 - 15:15 15:15 - 15:20	G. Laverny <i>Discussion</i>	UNLIGANDED VITAMIN D RECEPTOR IMPAIRS MORE MINERAL AND BONE HOMEOSTASIS THAN FULL RECEPTOR DEFICIENCY
15:20 - 15:30 15:30 - 15:35	H. St. John <i>Discussion</i>	GENOME-WIDE ANALYSIS OF THE COOPERATIVE ACTIONS OF $1,25(\text{OH})_2\text{D}_3$ AND PTH IN OSTEOCYTE DIFFERENTIATION
15:35 - 15:45 15:45 - 15:50	J. Ryan <i>Discussion</i>	VITAMIN D-MEDIATED BONE RESORPTION IS REGULATED BY MATURE OSTEOBLASTS, BUT NOT OSTEOCYTES, DURING GROWTH
15:50 - 16:00 16:00 - 16:05	H. Morris <i>Discussion</i>	1,25-DIHYDROXYVITAMIN D ANALOGUES WITH AN AROMATIC RING SUBSTITUTED IN THE 20,22-POSITION ELICIT DIFFERENTIAL ACTIVITIES IN MC3T3 AND MLO-A5 OSTEOBLAST-LIKE CELL LINES
	Paul Lips	CLOSING REMARKS
16:05 - 16:30	COFFEE BREAK	