



THE UNIVERSITY  
of EDINBURGH

# 14th International Conference on Limb Development and Regeneration

**igmm**

INSTITUTE OF GENETICS  
& MOLECULAR MEDICINE

**John McIntyre Centre, University of Edinburgh  
23rd - 26th July 2017**

**Organisers: Megan Davey, Laura Lettice, Malcolm Logan, Neil Vargesson  
Clinical workshop co-organisers: Wee Leon Lam, Ruth Newbury-Ecob**

**Plenary Lecture:  
Marian Ros**

**Speakers include:**

Denis Duboule  
Jerome Gros  
Bob Hill  
Marie Kmita  
Niamh Nowlan  
Michael K. Richardson  
James Sharpe  
Elly Tanaka  
Mikiko Tanaka  
Miguel Torres  
Rolf Zeller

**Sessions include:**

Evo-Devo  
Initiation  
Patterning  
Support tissues  
Regeneration  
+  
Clinical Workshop  
(Hand & Limb Syndromes,  
Radial aplasia, Thalidomide)

**\*Clinical Workshop**

**Speakers include:**

Brid Crowley  
Marybeth Ezaki  
David Fitzpatrick  
Stephan Guero  
Christine Hall  
Muriel Holder  
Steven Hovius  
Sahar Mansour  
Stefan Mundlos  
Kerby Oberg  
Gillian Smith

**\* Meeting qualifies for 6hrs CPD - Royal Society of Surgeons of Edinburgh  
Options for childcare available**



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The organisers of the 14<sup>th</sup> International Limb Development and Regeneration Conference gratefully acknowledge our sponsors:

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EMBO have kindly sponsored 'The EMBO Keynote Lecture' by Prof Denis Duboule





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## **Clinical Workshop – Continuing Professional Development (CPD) Accreditation**

The Clinical Workshop carries with it 6 hours of CPD from the Royal College of Surgeons of Edinburgh (Recognition number: RCSEd01856)

In order to qualify for the CPD credit please ensure you bring along your GMC/RCN Numbers and fill in the Attendance Form.

## **Program 14<sup>th</sup> International Limb Development and Regeneration Conference 2017**

**23 July- 26<sup>th</sup> July 2017**

**The John McIntyre Conference Centre, Edinburgh**

### **23rd July (Sunday)**

Conference Registration 17.00-18:00 (JMCC)

*Accommodation registration (JMCC)*

*Poster set-up Pentland West*

### **Plenary Speaker 18:00-19:00 Pentland East**

Marian Ros “*Understanding limb patterning: the last two decades*”

**Reception** 19:30-21:30 Centro

### **24<sup>th</sup> July (Monday)**

07:00 Runners/Walkers meet at Commonwealth Pool Steps, 1 hour run/walk Arthurs Seat

Breakfast- provided by accommodation (Pollock Halls xam-xam)

08:30-09:00 arrival coffee/tea and pastry

### **Session 1- 09:00-10:30, Evo-Devo**

Chair:

09:00-09:30 Marie Kmita- ‘*Contribution of Hoxa11 to limb evolution*’

09:30-09:45 Campbell Rolian ‘*The Longshanks Mouse I: Micro evo-devo of the vertebrate limb*’

09:45-10:00 Frank Chan ‘*The Longshanks Mouse II: Genomics and functional dissection of selection response towards longer tibia length in the mouse*’

10:00-10:15 Joost Woltering (Meyer Lab) ‘*From fin to fin – the evolution of spiny fins in acanthomorph fishes*’

10:15-10:30 Gabriela Neiva Frota-Lima (Frobisch Lab) ‘*Molecular evolution of preaxial polarity – insights into early and late limb development in the axolotl (Ambystoma mexicanum)*’

*10:30-10:45 Coffee JMCC Concourse*

## **Session 2-10:45-12:00 – Evo-Devo II**

10:45-11:15 Mikiko Tanaka “*Adaptive evolution of vertebrate limb morphology*”

11:15-11:30 Javier Lopez-Rios ‘*Molecular mechanisms in pig limb evolution*’

11:30-11:45 Constanze Bickelman ‘*Limb evolution in squamates: a case study in the basal gecko *Hemidactylus**’

11:45-12:00 Tomas Stewart (Wagner Lab) ‘*Transcriptomic evidence against tetrapod-wide digit identities and a reassessment of the homology of avian wing digits*’

12:00-12:15 Brent Hawkins (Harris Lab) ‘*These fish were made for walking: single mutations reveal hidden capacity for the formation of limb-like structures in the zebrafish*’

## **Session 3 - 12.15-13.00 - Initiation**

12:15-12:30 Maéva Luxey (Drouin Lab) ‘*Shox2, a new partner to define limb identity*’

12:30 -12:45 Gregg Duester ‘*Interaction of Retinoic acid, Fgf8 and Hox genes during limb development*’

12:45-13:00 Florence Petit (Ahituv Lab) ‘*Unravelling the TBX5 regulatory landscape*’

*1pm-2pm Lunch JMCC Restaurant*

## **Session 4-14:00- 15:30 – Patterning I**

14:00-14:30 Jerome Gros ‘*From Lateral Plate Mesoderm formation to limb position*’

14:30-14:45 Susan Mackem ‘*Sonic hedgehog acts, at least in part, through a signal relay rather than as a morphogen to specify digit identities*’

14:45-15:00 Joe Pickering (Towers Lab) ‘*Interactions between positional information and self-organisation in chick wing digit patterning*’

15:00-15:30 Miguel Torres “*Axial patterning during vertebrate limb development*”

*15:30-15:45 Coffee JMCC Concourse*

## **Session 5 – 15:45 – 17:30 – Patterning II**

15:45-16:15 James Sharpe “*Computer modelling of gene circuits to understand the dynamics of patterning*”

16:15-16:30 Paula Murphy ‘*Transcriptional control of the Wnt signalling system in the developing mouse embryo: an integrated view with focus on the limb*’

16:30-16:45 Devi Bridglal (Nowlan Lab) ‘*Identifying Critical Time Points for Early Chick Hip Development*’



16:45-17:00 I Cordeiro (Tanaka Lab) *'Fgfs can regulate metabolism and cell death during late limb development'*

17:00-17:15 Rocio Perez-Gomez (Ros Lab) *'Analysis of the protein-protein interactions of Sp6 and Sp8 in the limb ectoderm'*

17:15-17:45 Rolf Zeller *'Vertebrate Limb Organogenesis and Evolution: Exploring the Molecular Basis of Robustness and Diversification'*

17:45-19:15- Posters- drinks (20 poster boards- Pentland West)

### **25th July (Tuesday)**

7:00am Runners/Walkers meet at Commonwealth Pool Steps, 1 hour run/walk Arthurs Seat

Breakfast- provided by accommodation (Pollock Halls xam-xam)

08:30-09:00 arrival coffee/tea and pastry

### **Session 6- 09:15-10:30 – Patterning III**

09:00-09:30 Bob Hill *'Long range gene regulation drives polarizing activity'*

09:30-09:45 Endika Haro Gabicagogeascoa (Oberg Lab) *'Autoregulation of Lmx1B during limb development'*

09:45-10:00 Marc Fernandez Guerra (Ros Lab) *'New insights into the functional role of HoxC genes in the limb ectoderm'*

10:00-10:30 Stefan Mundlos *'Altered composition and dosage of a multipartite enhancer cluster at the Ihh locus results in gene misexpression and syndactyly'*

10:30-10:45 Coffee JMCC Concourse

### **Session 7-10:45- 13:00 Morphogenesis of support tissues**

10:45-11:15 Niamh Nowlan *'Fetal movement matters: the importance of biomechanical influences in shaping the prenatal skeleton'*

11:15-11:45 Elazer Zelzer *'TBC'*

11:45-12:00 Patrick Tschopp *'Adapting the limb neuromuscular system to changes in dactyly'*

12:00-12:15 Rui Diogo *'Muscle identity and attachments are mainly related to topological position, not to primordium or homotic identity of digits: insights from regeneration, developmental, teratological, and network studies'*

12:15-12:30 Karolina Kania (De Bari Lab) *'Heterogeneity of mesenchymal stem cells in joint development, homeostasis and disease'*

12:30-12:45 John Cobb *'The regulation of short-stature homeobox (Shox) gene expression during limb development in humans and mice'*

12:45-13:00 Gudrun Rappold *'Retinoic acid catabolizing enzyme CYP26C1 is a genetic modifier in SHOX deficiency'*

*1pm-2pm Lunch JMCC Restaurant*

14:00- 14:15 Nadine Schröder (Vortkamp Lab) *'Regulation of chondrocyte differentiation by Atoh8'*

14:15-14:30 Sigmar Stricker *'Odd skipped-related 1 (Osr1) identifies embryonic fibro-adipogenic progenitors (FAPS) and regulates a pro-myogenic transcriptional program during limb development'*

### **Session 8-14:30-16:00 – Regeneration**

14:30-15:00 Elly Tanaka *'Cell identity and patterning during axolotl limb regeneration'*

15:00- 15:15 Alberto Rosello-Diaz (Joyner Lab) *'Long-bone catch-up growth involves intrinsic enhancement and systemic restriction of organ size'*

15:15-15:30 Connor Dolan (Muneoka Lab) *'Hindlimb unloading (HU) inhibits regeneration of the mouse digit tip'*

15:30- 15:45 Akira Satoh – *'limb regeneration in Ambystoma mexicanum'*

15:45 - 16:00 – Malcolm Maden *'Multifaceted role of retinoic acid and its receptors during axolotl limb regeneration'*

*16:00-16:15 Coffee JMCC Concourse*

### **Session 9 – 16:15 – 17:15 Patterning IV**

16:15-16:30 Carolina Parada (Gros Lab) *'Mechanobiological control of progenitor cell renewal and differentiation during limb cartilage formation'*

16:30-16:45 Julie Gamart (Zeller Lab) *'Identification of SMAD4 Target Genes points to a Key Role in Modulating SHH Signaling during Early Limb Bud Development'*

16:45-17:00 Megan Davey *'Shh in the Emu'*

17:00-17:15 Philipp Germann (Sharpe Lab) *'Towards cell-based simulations of limb bud morphogenesis'*

### **The EMBO Keynote Lecture**

17:15-17:45 **The EMBO Keynote Lecture:** Denis Duboule

17:45-18:00 Discussion/Voting on Venue and Organiser's for 2019 Limb Conference

South Hall - Bar opens at 6.30pm, Dinner/Ceilidh from 7.30

### **26th July (Wednesday)**

07:00 Runners/Walkers meet at Commonwealth Pool Steps, 1 hour run/walk Arthurs Seat

Breakfast- provided by accommodation (Pollock Halls xam-xam)

08:45-09:10 arrival coffee/tea and pastry

#### ***Workshop - 09:10-10:30 Clinical Perspective of Limb Malformations and Management I – General Perspectives***

09:10-09:30: Kerby Oberg: *'Classification of Congenital Upper Limb Anomalies: Integrating Clinical and Experimental Insights'*

09:30-09:50: Stefan Mundlos: *'Categorising limb malformations combining clinical and molecular knowledge'*

9.50-10:10 David Fitzpatrick *'Limb malformations in humans caused by mutations in essential genes'*

10:10-10:20 Martijn Baas *'The prevalence of associated anomalies and syndromes among patients with radial longitudinal deficiency of the upper limb'*

10:20-10:30 Jaap Potiujt *'Intrafamilial variability of triphalangeal thumb phenotype: evidence for phenotypic progression over generations?'*

10:30-10:45 Coffee JMCC Concourse

#### ***Workshop -10:45-11:25: Clinical Perspective of Limb Malformations and Management II - Polydactyly***

10:45-11:05 Brid Crowley: *'Insights into the Pathogenesis of Pre-axial Polydactyly and how it influences surgical treatment'*

11:05-11:25 Stephen Hovius: *'Triphalangeal thumb, from phenotype to workbench and vice versa'*

#### ***Workshop -11:45-13:05: Clinical Perspective of Limb Malformations and Management III – Macroductyly, Central Longitudinal Deficiency and other conditions***

11:25-11:45: Marybeth Ezaki: *'Insights into the Pathogenesis of Macroductyly'*

11:45-12:05 Stephane Guero: *'Insights into the Pathogenesis of Central Longitudinal Deficiency (Cleft hand) - A Clinico-Scientific Approach'*

12:05-12:25: Gill Smith: '*Congenital Hand Differences and Associated Syndromes for the Clinician*'

12:25-12:45: Muriel Holder: "*Update on split hand split foot malformation and underlying molecular mechanisms*"

12:45-13:05: Bran Sivakumar: '*Classification and Management of Vascular Anomalies*'

13:05-14:05 *Lunch*

**Workshop - 14:10- 14:50: *Clinical Perspective of Limb Malformations and Management IV – Radial Aplasia***

14:05 –14:25 Malcolm Logan: '*Insights into the Pathogenesis of Radial Aplasia*'

14:25 –14:45 Ruth Newbury-Ecob '*It's in your hands – a combined clinical molecular and developmental approach to the diagnosis of limb defects*'

14:45–14:55 Wee Leon Lam '*Insights into the pathogenesis of radial aplasia (chicken model)*'

14:55-15:00 Julia Oh '*Insight into zeugopod anomalies using Fate mapping of the developing limb bud*'

**Workshop – 15:00- 15:45: *Clinical Perspective of Limb Malformations and Management V – The Future***

15:00-15:15 C Vanlerberghe '*Holt-Oram syndrome: clinical and molecular insights*'

15:15-15:30 Jonathan Rios '*FSTL5 is associated with idiopathic clubfoot and hindlimb skeletal development*'

15:30-15:45 David Hootnick '*Parsing the shadows in Plato's cave: Embryonic arterial dysgenesis in human limb dysmorphologie*'

15:45-16:00 *Coffee JMCC Concourse*

**Workshop – 16:00 – 16:30 *Thalidomide update***

16:00-16:30 Sahar Mansour and Christine Hall '*Thalidomide diagnostic algorithm update*'