

## **Tetsuya Nakamura, Ph.D.**

Organismal Biology and Anatomy, University of Chicago  
Culver Hall 108, 1027 E, 57<sup>th</sup> Street | Chicago, IL 60637 | (773) 834-4774  
[tetsuya@uchicago.edu](mailto:tetsuya@uchicago.edu) | <http://tetsuyanakamura.work>

### **Research Focus**

Molecular mechanisms of the vertebrate major transitions by an interdisciplinary approach  
Evolutionary and developmental mechanisms of appendage diversity and prediction of morphological evolution

### **Education**

Mar 2007. **Ph.D. in Developmental Biology.** Emphasis on the robustness of left-right asymmetry. Osaka University  
Mar 2002. **B.S. in Engineering.** Regeneration of human cartilage. Osaka University

### **Honors, Awards and Fellowships**

#### **University of Chicago**

Reported on the front page of *The New York Times* on August 18, 2016  
MBL Whitman Center Research Award 2014  
The research fellowship for abroad of the Uehara Memorial Foundation 2014  
Postdoctoral Fellowship for Research Abroad (JSPS) 2012-2013

#### **Osaka University**

Reported on Japanese daily newspaper “Yomiuri” 2013  
Paper picks of *Developmental Cell* (recommended by Professor Clifford J. Tabin) 2011  
Research fellowship for young scientists (Postdoctoral, JSPS) 2008  
Research fellowship for young scientists (Doctoral, JSPS) 2005-2007

### **Research Experience**

#### **University of Chicago**

**2012-Present**                      **Postdoctoral Research Associate**  
**Dept. of Organismal Biology and Anatomy,**

*Postdoctoral Advisor:* Professor Neil H Shubin

*Collaborator:* Professor José Luis Gómez Skarmeta (Chromatin conformation)

#### **Osaka University (Japan)**

**2008-2012**                      **Assistant Professor**  
**Dept. of Frontier Biosciences**

*Collaborator:* Professor Atsushi Mochizuki (Theoretical biology)  
**Osaka University (Japan)**  
**2007-2008**            **Postdoctoral Scholar**  
**Dept. of Frontier Biosciences,**

**Osaka University (Japan)**  
**2002-2007**            **Graduate students**  
**Dept. of Frontier Biosciences**  
*PhD Advisor:* Professor Hiroshi Hamada

**Osaka University (Japan)**  
**1998-2002**            **Undergraduate**  
**Dept. of engineering**

### **Funded Grants**

- 2015            The 44<sup>th</sup> KANAE grants (Kanae Memorial Foundation for the Promotion of the Medical Science)  
Principal Investigator  
“The molecular mechanisms of interactions and fusions of each tissue in the skate development”
- 2014            Whitman Center Research Award (Marine Biological Laboratory),  
Principal Investigator  
“Deeply conserved *Hox* collinearity autonomously produces diversified fin patterns and evolution depending on appendage size”
- 2011 - 2012   Grant-in-Aid for Scientific Research on Innovative Areas (JSPS)  
Principal Investigator  
“The mechanisms to produce 99.99% canalization in the development of left-right asymmetry”
- 2011 - 2012   Grant-in-Aid for Young Scientists B (JSPS)  
Principal Investigator  
“Asymmetric BMP signal determines the direction of heart and gut coiling”
- 2009 - 2011   Osaka university Grant for Interdisciplinary projects  
Principal Investigator  
“Understanding the developmental process as a balance of noise and stabilization”
- 2008            JSPS Grant-in-Aid for Scientific Research  
“The mechanisms produce the robustness of left-right asymmetry”
- 2004 to 2007   JSPS Grant-in-Aid for Scientific Research

“A reaction-diffusion system determines left-right asymmetry”

**Selected Publications (\* Corresponding author)**

Nakamura T\*, Gehrke AR\*, Lemberg J, Szymaszek J, Shubin NH (contributed equally to this work)

Digits and fin rays share common developmental histories.

*Nature*, 2016

Inaba Y, Shinohara K, Botilde Y, Nabeshima R, Takaoka K, Ajima R, Lamri L, Takeda H, Saga Y, **Nakamura T**, Hamada H\*.

Transport of the outer dynein arm complex to cilia requires a cytoplasmic protein Lrrc6.

*Genes Cells*. 2016 Jul;21(7):728-39.

Braasch I, Gehrke AR, Smith JJ, Kawasaki K, Manousaki T, Pasquier J, Amores A, Desvignes T, Batzel P, Catchen J, Berlin AM, Campbell MS, Barrell D, Martin KJ, Mulley JF, Ravi V, Lee AP, **Nakamura T** et.al

The spotted gar genome illuminates vertebrate evolution and facilitates human-teleost comparisons.

*Nat Genet*. 2016 Apr;48(4):427-37.

**Nakamura T**, Klomp J, Pieretti J., Schneider I., Gehrke AR., Shubin NH\*.

Molecular mechanisms underlying the exceptional adaptations of batoid fins.

*Proc Natl Acad Sci U S A*. 2015 Dec 29;112(52):15940-5.

Pieretti J, Gehrke AR, Schneider I, Adachi N, **Nakamura T**, Shubin NH\*.

Organogenesis in deep time: A problem in genomics, development, and paleontology.

*Proc Natl Acad Sci U S A*. 2015 Apr 21;112(16):4871-6

Gehrke AR, Schneider I, de la Calle-Mustienes E, Tena JJ, Gomez-Marin C, Chandran M, **Nakamura T**, Braasch I, Postlethwait JH, Gómez-Skarmeta JL, Shubin NH\*.

Deep conservation of wrist and digit enhancers in fish.

*Proc Natl Acad Sci U S A*. 2015 Jan 20;112(3):803-8

Dong F, Shinohara K, Botilde Y, Nabeshima R, Asai Y, Fukumoto A, Hasegawa T, Matsuo M, Takeda H, Shiratori H, **Nakamura T** and Hamada H\*.

Pih1d3 is required for cytoplasmic pre-assembly of axonemal dynein in mouse sperm.

*Journal of Cell Biology*, 2014 Jan 20;204(2):203-13

Inácio JM, Marques S, **Nakamura T**, Shinohara K, Meno C, Hamada H, Belo JA\*. The dynamic right-to-left translocation of Cerl2 is involved in the regulation and termination of Nodal activity in the mouse node.

*PLoS One*. 2013. 8(3):e60406

**Nakamura T\***, Saito D, Kawasumi A, Shinohara K, Asai Y, Takaoka K, Dong F, Takamatsu A, Belo JA, Mochizuki A\*, Hamada H.

Fluid flow and interlinked feedback loops establish left-right asymmetric decay of

Cer12 mRNA.

*Nature Communications*. 2012;3:1322.

Lei Z, Maeda T, Tamura A, **Nakamura T**, Yamazaki Y, Shiratori H, Yashiro K, Tsukita S, Hamada H\*.

EpCAM contributes to formation of functional tight junction in the intestinal epithelium by recruiting claudin proteins.

*Developmental Biology*. 2012 Nov 15;371(2):136-45.

**Nakamura T\***, Hamada H.

Left-right patterning: conserved and divergent mechanisms.

*Development*. 2012 Sep;139(18):3257-62.

Kawasumi.A, **Nakamura T**, Iwai N, Yashiro K, Saijoh Y, Belo J, Shiratori H, Hamada H\*.

Left-right asymmetry of Nodal activity in the node is translated into left-right asymmetry in the lateral plate of mouse embryos.

*Developmental Biology*, 2011, 2011 May 15;353(2):321-30.

Tanaka C, Sakuma R, **Nakamura T**, Hamada H, Saijoh Y\*.

Long-range action of Nodal requires interaction with GDF1.

*Genes and Development*. 2007 Dec 15;21(24):3272-82.

**Nakamura T**, Mine N, Nakaguchi E, Mochizuki A, Yamamoto M, Yashiro K, Meno C, Hamada H\*.

Generation of robust left-right asymmetry in the mouse embryo requires a self-enhancement and lateral-inhibition system.

*Developmental Cell*, 11, 495-504, 2006

Saijoh Y, Oki S, Tanaka C, **Nakamura T**, Adachi H, Yan YT, Shen MM, Hamada H\*.

Two nodal-responsive enhancers control left-right asymmetric expression of Nodal.

*Developmental Dynamics*, 232(4);1031-1036; 2005

Takagi M, **Nakamura T**, Matsuda C, Hattori T, Wakitani S, Yoshida T\*.

In vitro proliferation of human bone marrow mesenchymal stem cells employing donor serum and basic fibroblast growth factor.

*Cytotechnology*, 43:89-96,2003

### **Invited oral presentations;**

2012 Oral presentation at the Japanese Society of Veterinary Science 153th annual meeting, Saitama, Japan

Mechanism for converting subtle asymmetric fluid flow into left-right asymmetry

- 2012 Oral presentation at the CDB SYMPOSIUM “Quantitative Biology” at RIKEN, KOBE, Japan  
Generation of Robust Left-Right Asymmetry in the Mouse Embryo
- 2011 Oral presentation at the 8th European Conference on Mathematical and Theoretical Biology and Annual Meeting of The Society for Mathematical Biology, Kraków, Czech Republic  
The mechanisms to establish robust left-right asymmetry
- 2009 Oral presentation at the Japanese Biochemical Society 82th annual meeting, Kobe, Japan  
How is Left-Right axis established robustly?
- 2009 Oral presentation at the Japan Society for Quantitative meeting, Tokyo, Japan  
Robustness of Left-Right asymmetry
- 2008 Oral presentation at the Japanese society for Cell biology 60<sup>th</sup> annual meeting, Yokohama, Japan  
Generation of Robust Left-Right Asymmetry in the Mouse Embryo
- 2006 Oral presentation at the Japanese-Korean Joint Meeting for Mathematical Biology, Kyusyu, Japan  
Generation of robust left-right asymmetry in the mouse embryo requires a self-enhancement and lateral-inhibition system
- 2006 Oral presentation at the CDB symposium “Logic of Development”, KOBE RIKEN, Japan  
Generation of robust asymmetry for left-right patterning in the mouse embryo requires a reaction-diffusion system