

# Curriculum Vita

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Assistant Professor

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## Appointment

**2019.2-present:** Assistant Professor, PI, University of California, Riverside, School of Medicine, CA, USA

**2015.10-2019.1:** Assistant Professor, PI, University of Nevada, Reno School of Medicine, Reno, NV, USA

**2011.7-2015.9:** Assistant Professor, Co-PI, Institute of Zoology, Chinese Academy of Sciences, Beijing, China

## Education

**2001-2006:** M.D – (Medicine) Chongqing Medical University, Chongqing, China

**2006-2011:** Ph.D - (Developmental biology) Institute of Zoology, Chinese Academy of Sciences, Beijing, China

## Honors & Awards:

2013: Elected as Fellow of Youth Innovation Promotion Association, Chinese Academy of Science

2011: Dean's Outstanding Award of Chinese Academy of Sciences

## Grants:

### *Ongoing:*

Funding Source: NIH/NICHHD (R01 HD092431)

Project title: Sperm tsRNAs and their RNA modifications in diet-induced epigenetic inheritance

2017.08-2022.06

Role: PI (1,494,000 USD)

### *Finished:*

Funding Source: NIH/NIDDK (P30 GM110767-03)

Project title: AQP3 in bladder urothelial mechanosensing in mice: functions and mechanisms

2016.08-2017.07

Role: PI

### *Grants before coming to United States*

Funding Source: The National Basic Research Program of China (Grant No. 2015CB943000)

Project title: Long non-coding RNAs (LncRNAs) and spermatogenesis 2015.01.01-2019.12.31

Role: PI (1.5 million RMB ≈ 250,000 USD)

Funding Source: Funding package for the fellow of Youth Innovation Promotion Association, Chinese Academy of Sciences (Grant No. 2013061) 2013.01.01-2016.12.31

Role: PI (0.4 million RMB ≈ 66,666 USD)

Funding Source: National Natural Science Foundation of China (Grant No. 31200879)

Project name: Testis-specific aqp3 splice variants in sperm osmoadaptation: function and mechanisms

2013.01.01-2015.12.31

Role: PI (0.23 million RMB ≈ 38,333 USD)

Funding Source: The National Basic Research Program of China (Grant No. 2011CB944400)

Project name: Molecular mechanism governing pregnancy establishment and maintenance: molecular regulation of intrauterine embryo localization 2011.01.01-2015.12.31

Role: Major participator (1.8 million RMB ≈ 300,000 USD)

### **Invited Talks:**

**Mar 2020** Keystone Symposia on Skirting Mendel: Non-Classical Mechanisms of Phenotypic Variation, Inheritance and Disease, Whistler, British Columbia, Canada.

**Mar 2020** Society for Reproductive Investigation (SRI) International Meeting, Vancouver, Canada.

**Oct 2019** DOHaD 2019 Symposium, Melbourne, Australia

**Aug, 2019** Cancer Research UK Manchester Institute, University of Manchester, UK

**Aug, 2019** Symposium for Epigenetic Inheritance: impact for biology and society, Zurich, Switzerland.

**July, 2019** The 17th SCBA international Symposium, Kunming, China

**July, 2019** SSR 2019 Annual Meeting, San Jose, CA, USA

**June, 2019** Phyllis and Mark Leppert Foundation for Fertility Research, Salt Lake City, USA

**May, 2019** Gordon Research Conference on Germinal Stem Cell Biology, HongKong, China

**Mar, 2019** 58th Annual Society of Toxicology Meeting, Baltimore, USA

**Feb, 2019** SUFU 2019 Winter Meeting, Miami, USA

**Nov, 2018** 5th Conference on the Frontiers of Reproductive Biology, Beijing, China

**Oct, 2018** 3rd International Symposium of Epigenetic Mechanism and Human Health, Shenzheng, China

**Sep, 2018** Epigenetics in Cognition- Developmental and Evolutionary perspective, Erice, Sicily, Italy.

**Apr, 2018** Genetics, Genomics, and Bioinformatics seminar at UC Riverside, CA, USA

**Apr, 2018** Reproductive & Developmental Biology Laboratory (RDBL) seminar, NIEHS/NIH, NC, USA

**Mar, 2018** Reproduction&Development: Revealing the Origin of Life, Welcome Genome Campus, Hinxton, UK

**Nov, 2017** Cold Spring Harbor Asia: RNA Modifications & Epitranscriptomics, Suzhou, China

**Oct, 2017** *The Rank Prize Funds* Mini-Symposium on Maternal and Paternal Intergenerational Programming Effects, Grasmere, UK

**Oct, 2017** Invited seminar at PDN department, University of Cambridge, UK

**June, 2017** Programming and Reprogramming the Vertebrate Germline - Gordon Research Conference, HongKong, China

**Feb, 2017** CMBAG seminar at The Scripps Research Institute, San Diego, USA

**Oct, 2016** The 4<sup>th</sup> SKLRB Symposia in Reproductive Biology, Beijing, China.

**Sep, 2016** 2016 tRNA Conference, Jeju, Korea

**Aug, 2016** Mammalian Reproduction - Gordon Research Conference, Waterville Valley, NH, USA

**June, 2015** SSR 2015 Annual Meeting, San Juan, Puerto Rico, USA

**May, 2015** Non-Coding RNA: New Mechanisms and Approaches, Boston, USA

**Oct, 2014** The 3<sup>rd</sup> SKLRB Symposia in Reproductive Biology, Beijing, China.

**Sep, 2012** EMBO Workshop - Cell Biology of Early Mouse Development, Cambridge, UK.

**May, 2012** The 2<sup>nd</sup> SKLRB Symposia in Reproductive Biology, Beijing, China.

**Oct, 2010** International Symposia of Channelopathy & New Strategies of Drug Discovery, Changchun, China.

**May, 2010** The 1<sup>st</sup> SKLRB Symposia on Frontiers in Perimplantation Biology, Beijing, China.

## Academic membership and services

**2016-present:** Regular member of the Society for the Study of Reproduction (SSR)

**2019-present:** Full member of the Society of Developmental Biology (SDB)

**2017-present:** Editorial Board Member of ***Biology of Reproduction***

**2018-present:** Editorial Board Member of ***Cell Discovery***

### Ad hoc reviewer for journals:

*Nature Cell Biology, Cell Research, Nature Communications, Science Advances, Molecular Psychiatry, PNAS, Cell Reports, PloS Genetics, Development, BMC Biology, Philosophical Transactions B, FASEB J, Cell Discovery, Journal of Biological Chemistry, Bioessays, Scientific Reports, Biology of Reproduction, Human Reproduction, Molecular Human Reproduction, Fertility & Sterility, Journal of Endocrinology, Reproduction et.al*

## Publications:

### (I) First author/Corresponding author (\*Co-first authors; #Corresponding authors)

- Zhang Y, Shi J, Rassoulzadegan M, Tuorto F, **Chen Q**<sup>#</sup>. Sperm RNA code in programming offspring metabolic health. ***Nature Reviews Endocrinology*** (in press)
- Zhang Y, **Chen Q**<sup>#</sup>. The expanding repertoire of hereditary information carriers. ***Development*** (2019) 146: dev170902 doi:10.1242/dev.170902
- Liu Y, **Chen Q**<sup>#</sup>. 150 years of Darwin's theory of intercellular flow of hereditary information. ***Nature Reviews Molecular Cell Biology*** (2018) 19, 749–750
- Shi J, Zhang Y, Zhou T<sup>#</sup>, **Chen Q**<sup>#</sup>. tsRNAs: the Swiss army knife for translational regulation. ***Trends in Biochemical Sciences*** (2018) Oct 5; <https://doi.org/10.1016/j.tibs.2018.09.007>
- **Chen Q**<sup>\*</sup>, Shi J<sup>\*</sup>, Tao Y, Zernicka-Goetz M<sup>#</sup>. Tracing the origin of heterogeneity and symmetry breaking in the early mammalian embryo. ***Nature Communications*** (2018) May 8;9(1):1819
- Zhang Y<sup>\*</sup>, Zhang X<sup>\*</sup>, Shi J<sup>\*</sup>, Tuorto F<sup>\*</sup>, Li X<sup>\*</sup>, Liu Y, Liebers R, Zhang L, Qu Y, Qian J, Pahima M, Liu Y, Yan M, Cao Z, Lei X, Cao Y, Peng H, Liu S, Wang Y, Zheng H, Woolsey R, Quilici D, Zhai Q, Li L, Zhou T, Yan W, Lyko F, Zhang Y<sup>#</sup>, Zhou Q<sup>#</sup>, Duan E<sup>#</sup>, **Chen Q**<sup>#</sup>. Dnmt2 mediates intergenerational transmission of paternally acquired metabolic disorders through sperm small non-coding RNAs. ***Nature Cell Biology*** (2018) May;20(5):535-540.  
-Highlighted in: *Nat Rev Endocrinol.* 2018 Aug;14(8):446-447.
- Shi J<sup>#</sup>, Ko EA, Sanders KM, **Chen Q**<sup>#</sup>, Zhou T<sup>#</sup>. SPORTS1.0: a tool for annotating and profiling non-coding RNAs optimized for rRNA- and tRNA- derived small RNAs. ***Genomics Proteomics & Bioinformatics*** (2018) Apr;16(2):144-151
- Zhang Y, Shi J, **Chen Q**<sup>#</sup>. tsRNAs: new players in mammalian retrotransposon control. ***Cell Research***. (2017) Nov;27(11):1307-1308
- Shi J, Zhang X, Liu Y, **Chen Q**<sup>#</sup>. Epigenetic information in gametes: gaming from before fertilization. ***Physics of Life Reviews***. (2017) Mar; 20:146-149.
- Zhang X<sup>\*</sup>, Cozen AE<sup>\*</sup>, Liu Y, **Chen Q**<sup>#</sup>, Lowe TM<sup>#</sup>. Small RNA Modifications: Integral to Function and Disease. ***Trends in Molecular Medicine***. (2016) (12):1025-1034.
- **Chen Q**<sup>#</sup>, Yan W<sup>#</sup>, Duan E<sup>#</sup>. Epigenetic inheritance of acquired traits through sperm RNAs and sperm RNA modifications. ***Nature Reviews Genetics***. (2016) (12):733-743.
- Shi J<sup>\*</sup>, Zhang Y<sup>\*</sup>, **Chen Q**<sup>#</sup>. Molecular carriers of acquired inheritance: absence of evidence is not evidence of absence. ***Environmental Epigenetics***. (2016) 2 (2): dww014
- **Chen Q**<sup>\*#</sup>, Yan M<sup>\*</sup>, Cao Z<sup>\*</sup>, Li X<sup>\*</sup>, Zhang Y<sup>\*</sup>, Shi J<sup>\*</sup>, Peng H, Zhang X, Zhang Y, Duan E<sup>#</sup>, Zhai Q<sup>#</sup>, Zhou Q<sup>#</sup>. Sperm tsRNAs contribute to intergenerational inheritance of an acquired metabolic disorder. ***Science***

(2016) Jan 22;351(6271):397-400.

-Editorial & Interview by: *Science*. 2016 Jan 1;351(6268):13.

-Highlighted in: *Nat Rev Genet*. 2016; 17(3):128.

-Highlighted in: *Cell Metab*. 2016; 23(3), 401-402.

-Highlighted in: *Cell Res*. 2016;26(4):395-6.

-Highlighted in: *FASEB J*. 2016;30(5):1691-3

-Highlighted in: *Biol Reprod*. 2016;94(4):73.

-Highlighted in: *Science Bulletin*, 2016; 61(6) 428-429.

- Shi J\*, **Chen Q\***, Li X\*, Zheng X\*, Zhang Y, Qiao J, Tang F, Tao Y#, Zhou Q#, Duan E#. Dynamic transcriptional symmetry-breaking in pre-implantation mammalian embryo development revealed by single-cell RNA-seq. *Development*. (2015) 15;142(20):3468-77.  
-Highlighted in: *Development 2015 142: e2002*
- Zhang Y\*, **Chen Q\***, Zhang H\*, Wang Q\*, Rong L, Jin Y, Wang H, Ma T, Qiao J, Duan E. Aquaporin-mediated excessive intrauterine fluid is a major contributor in hyper-estrogen induced aberrant embryo implantation. *Cell Research*. (2015) Jan,25(1):139-42.
- Zhang S, Kong S, Wang B, Cheng X, Chen Y, Wu W, Wang Q, Shi J, Zhang Y, Wang S, Lu J, Lydon JP, DeMayo F, Pear WS, Han H, Lin H, Li L, Wang H, Wang YL, Li B, **Chen Q\***, Duan E#, Wang H#. Uterine Rbpj is required for embryonic-uterine orientation and decidual remodeling via Notch pathway-independent and -dependent mechanisms. *Cell Research* (2014), 24:925-942.  
-Cover Story  
-Highlighted in: *Cell Res*. (2014); 24:1031-2
- Zhang Y, Zhang Y, Shi J, Zhang H, Cao Z, Gao X, Ren W, Ning Y, Ning L, Cao Y, Chen Y, Ji W, Chen Z#, **Chen Q\***, Duan E#. Identification and characterization of an ancient class of small RNAs enriched in serum associating with active infection. *Journal of Molecular Cell Biology* (2014), 6:172-174.  
-Cover Story & Editor's Recommendation
- **Chen Q\***, Zhang Y\*, Elad D, Jaffa AJ, Cao Y, Ye X#, Duan E#. Navigating the site for embryo implantation: Biomechanical and molecular regulation of intrauterine embryo distribution. *Molecular Aspects of Medicine* (2013) 34:1024-42.
- Peng H, Shi J, Zhang Y, Zhang H, Liao S, Li W, Lei L, Han C, Ning L, Cao Y, Zhou Q, **Chen Q\***, Duan E#. A novel class of tRNA-derived small RNAs extremely enriched in mature mouse sperm. *Cell Research* (2012), 22: 1609-1612.  
-Highlighted in: *Cell Res*. (2013);23:18-19.
- **Chen Q**, Duan EK. Aquaporins in sperm osmoadaptation: an emerging role for volume regulation. *Acta Pharmacol Sin* (2011), 32: 721-4
- **Chen Q\***, Peng H\*, Lei L\*, Zhang Y, Kuang H, Cao Y, Shi QX, Ma T, Duan E#. Aquaporin3 is a sperm water channel essential for postcopulatory sperm osmoadaptation and migration. *Cell Research* (2011), 21: 922-933.
- **Chen Q\***, Zhang Y\*, Peng H, Lei L, Kuang H, Zhang L, Ning L, Cao Y, Duan E#. Transient  $\beta$ 2-Adrenoceptor activation confers pregnancy loss by disrupting embryo spacing at implantation. *Journal of Biological Chemistry* (2011), 286: 4349-4356.
- **Chen Q\***, Zhang Y\*, Lu J, Wang Q, Wang S, Cao Y, Wang H, Duan E. Embryo-uterine cross-talk during implantation: the role of Wnt signaling. *Molecular Human Reproduction* (2009), 15: 215-221.
- **Chen Q**, Peng H, Zhang Y, Lei L, Cao Y, Duan E. Embryo implantation: a time for recalling and forwarding. *Chinese Sci Bull* (2009),54: 4083-93.
- Kuang H\*, **Chen Q\***, Zhang Y, Zhang L, Peng H, Ning L, Cao Y, Duan E#. The cytokine gene, CXCL14, restricts human trophoblast cell invasion by suppressing gelatinase activity. *Endocrinology* (2009), 150: 5596-5605.
- Kuang H\*, **Chen Q\***, Fan X, Zhang Y, Zhang L, Peng H, Cao Y, Duan E#. CXCL14 inhibits trophoblast outgrowth via a paracrine/ autocrine manner during early pregnancy in mice. *Journal of Cellular Physiology* (2009), 221: 448-457.

## (II) Other Co-authored publications:

- Wang J., Xie X., Shi J., He W., **Chen Q.**, Chen L., Gu W., and Zhou T., Denoising autoencoder, a deep learning algorithm, aids the identification of a novel molecular signature of lung adenocarcinoma. **Genomics, Proteomics & Bioinformatics** (in press)
- Wang J, Wang L, Feng G, Wang Y, Li Y, Li X, Liu C, Jiao G, Huang C, Shi J, Zhou T, **Chen Q.**, Liu Z, Li W, Zhou Q. Asymmetric Expression of *LincGET* Biases Cell Fate in Two-Cell Mouse Embryos. **Cell** (2018) Dec 13;175(7):1887-1901.e18
- Durnin L, Kwok B, Kukadia P, McAvera R, Corrigan RD, Ward SM, Zhang Y, **Chen Q.**, Koh SD, Sanders KM, Mutafova-Yambolieva VN. An ex vivo bladder model with detrusor smooth muscle removed to analyze biologically active mediators released from the suburothelium. **J Physiol.** 2018 Oct 5. doi: 10.1113/JP276924.
- Huang L, Meng TG, Ma XS, Wang ZB, Qi ST, **Chen Q.**, Zhang QH, Liang QX, Wang ZW, Hu MW, Guo L, Ouyang YC, Hou Y, Zhao Y, Sun QY. Rad9a is involved in chromatin decondensation and post-zygotic embryo development in mice. **Cell Death & Differentiation.** (2018) doi:10.1038/s41418-018-0181-9
- Zhou T, Xie X, Li M, Shi J, Zhou J, Knox K, Wang T, **Chen Q.**, Gu W. Rat BodyMap transcriptomes reveal unique circular RNA features across tissue types and developmental stages. **RNA** 2018; doi: 10.1261/rna.067132.118.
- Qian J, Zhang Y, Qu Y, Zhang L, Shi J, Zhang X, Liu S, Kim BH, Hwang SJ, Zhou T, **Chen Q.**, Ward SM, Duan E, Zhang Y. Caffeine consumption during early pregnancy impairs oviductal embryo transport, embryonic development and uterine receptivity in mice. **Biology of reproduction.** 2018 DOI: 10.1093/biolre/ioy155
- Qiao J, Zhao H, Zhang Y, Peng H, **Chen Q.**, Zhang H, Zheng X, Jin Y, Ni H, Duan E, Guo Y. GPR39 is region-specifically expressed in mouse oviduct correlating with the Zn<sup>2+</sup> distribution. **Theriogenology.** 2017 Jan 15; 88:98-105.
- Deng Z., Lei X., Zhang X., Zhang H., Liu S., **Chen Q.**, Hu H., Wang X., Ning L., Cao Y., Zhao T., Zhou J., Chen T., Duan E. mTOR signaling promotes stem cell activation via counterbalancing BMP-mediated suppression during hair regeneration. **J Mol Cell Biol.** 2015 Feb;7(1):62-72
- Wang H, Wan H, Li X, Liu W, **Chen Q.**, Wang Y, Yang L, Tang H, Zhang X, Duan E, Zhao X, Gao F, Li W\*. Atg7 is required for acrosome biogenesis during spermatogenesis in mice. **Cell Res.** 2014 Jul;24(7):852-69.
- Lei X, Deng Z, Zhang H, Zhao H, Zhou J, Liu S, **Chen Q.**, Ning L, Cao Y, Wang X, Zhang X, Duan E. Rotary suspension culture enhances mesendoderm differentiation of embryonic stem cells through modulation of Wnt/ $\beta$ -catenin pathway. **Stem Cell Rev.** 2014 Aug;10(4):526-38.
- Fu Z, Wang B, Wang S, Wu W, Wang Q, Chen Y, Kong S, Lu J, Tang Z, Ran H, Tu Z, He B, Zhang S, **Chen Q.**, Jin W, Duan E, Wang H, Wang YL, Li L, Wang F, Gao S, Wang H. Integral proteomic analysis of blastocysts reveals key molecular machinery governing embryonic diapause and reactivation for implantation in mice. **Biol Reprod.** 2014 Mar 13;90(3):52.
- Wang Q, Lu J, Zhang S, Wang S, Wang W, Wang B, Wang F, **Chen Q.**, Duan E, Leitges M, Kispert A, Wang H. Wnt6 is essential for stromal cell proliferation during decidualization in mice. **Biol Reprod.** 2013 Jan 3;88(1):5.
- Zhang H, Zhang Y, Zhao H, Zhang Y, **Chen Q.**, Peng H, Lei L, Qiao J, Shi J, Cao Z, Duan E, Jin Y. Hormonal regulation of ovarian bursa fluid in mice and involvement of aquaporins. **PLoS One.** 2013 May 22;8(5):e63823.
- Zhang Q, **Chen Q.**, Lu X, Zhou Z, Zhang H, Lin HY, Duan E, Zhu C, Tan Y, Wang H. CUL1 promotes trophoblast cell invasion at the maternal-fetal interface. **Cell Death Dis.** 2013 Feb 21;4:e502.
- Peng H, Zhang Y, Lei L, **Chen Q.**, Yue J, Tan Y, Duan E. Aquaporin 7 expression in postimplantation mouse

uteri: a potential role for glycerol transport in uterine decidualization. *Fertil Steril*. 2011 Mar 15;95(4):1514-7.e1-3.

- Zhang L, Guo W, **Chen Q**, Fan X, Zhang Y, Duan E; Adam12 Plays a Role during Uterine Decidualization in Mice. *Cell and Tissue Research* 2009 Dec;338(3):413-21.
- Peng H, **Chen Q**, Tan Y. Frequent ejaculation associated free radical and lactic acid accumulation cause noninfectious inflammation and muscle dysfunction: a potential mechanism for symptoms in Chronic Prostatitis/Chronic Pelvic Pain Syndrome. *Med Hypotheses*. 2009;73(3):372-3.
- Kuang H, Zhang L, Peng J, **Chen Q**. Premature ovarian failure, menopause and ovarian cancer, three nodes on the same string: Pten and other potential genes on the go. *Med Hypotheses* 2009;73(6):961-2.
- Zhang Y, Peng S, Kuang H, **Chen Q**, Liu S, Zhang L, Duan E: Expression and regulation of Dickkopf2 during periimplantation in mice. *J Reprod Dev* 2009;55:17-22.
- Peng S, Li J, Miao C, Jia L, Hu Z, Zhao P, Li J, Zhang Y, **Chen Q**, Duan E: Dickkopf-1 secreted by decidual cells promotes trophoblast cell invasion during murine placentation. *Reproduction* 2008;135:367-375.