

CV, Emma R Andersson

Scientific Goals

My goal is to unravel how genetics and environment control embryonic development, to harness developmental pathways and design therapies for congenital disorders. I therefore performed PhD and post doc studies on developmental signaling pathways and embryonic development, and performed research at Rockefeller University to develop a high-throughput in vivo technology for genetic manipulation in utero. Now, my lab focuses on gene discovery projects focused on unravelling the mechanisms driving Notch-related congenital disorders, and neurodevelopmental disorders. In parallel, we are developing technologies to reduce the amount of animals used in science.



Current Position(s)

- 2016 –** **Assistant Professor**, Karolinska Institutet (KI, ranked 1st of 262 applicants)
My research group focuses on genetic disorders, using mouse models, high throughput in vivo genetic manipulation, 3D in vitro culture methods, transcriptomics, and collaborations with clinicians specializing in congenital disorders.
- 2016 -** **Director**, Virus Technologies Core Facility
I established a core facility to produce high quality, ultra-high titer lentivirus and AAV to researchers in Sweden. This core facility is funded by StratNeuro with 2MSEK per year.
- 2014-** **Scientific Manager**, INFIGINENE, Core Facility (KMW/KI)
I established this core facility to disseminate the technique I developed (high through-put in utero genetic manipulation) using nano-injection of lentivirus encoding cDNAs, shRNA or sgRNA/Cas9 for CRISPR targeting. This core facility is supported by KI Mouse Models (KIMM). I provided the equipment (1MSEK)

Previous positions

- 2014-2015** **Senior Researcher**, Karolinska Institutet (*Same as Assistant Professor above*)
- 2012** **Guest Researcher, Rockefeller University**
*In order to develop ultrasound-guided in utero nano-injection for targeting new organ systems, I performed guest research in Professor **Elaine Fuchs**' and **Mary E Hatten**'s labs. I hypothesized that injecting lentivirus prior to neurulation would target the future nervous system. This was successful and the technique forms the basis of our gene-discovery projects in the nervous system and other organs, and is established as a core facility (see above)*
- 2009 - 2013** **Post-Doctoral Researcher, CMB, Karolinska Institutet**
*During my postdoctoral research with Professor **Urban Lendahl** I developed a novel mouse model for Alagille syndrome. This forms the basis of my lab's projects on Notch signaling and Alagille.*

Graduate Research

2004 - 2009 **PhD Studies**, PI: Ernest Arenas, MBB, Karolinska Institutet

During my PhD with Professor Ernest Arenas I discovered that canonical and non-canonical Wnts synergize to control dopaminergic neuron development, but antagonize one another with respect to nervous system convergent extension in vivo. Using this knowledge, I developed an improved differentiation protocol for producing dopaminergic neurons from embryonic stem cells and neural stem cells.

Undergraduate Research

2003 **Master's Degree Thesis**, Ola Hermanson, KI, **Award for best Master's thesis**

1999 - 2003 **Filosofie Magister (MSc)**, Molecular Biology, Stockholm University, Sweden

Awards and Distinctions

2017 **The Daniel Alagille Award**

*This prize for **one** internationally competitive young scientist (under 40) in Europe is awarded by the European Association for the Study of the Liver (EASL), for research in the field of genetic liver disorders (€ 25,000).*

2017 **EASL Mentoring Programme recipient**

This European mentorship program awards two mentees per year with a mentor, in international competition and provides funds for visits and networking. I was selected and have been matched with Mario Strazzabosco, Yale, USA.

2014 **Sven och Ebba-Christina Hagbergs prize & grant**

This prize for excellent young scientists, awarded every second year at Karolinska Institutet, is a personal prize (150,000SEK) and research grant (120,000SEK).

Publications

Researcher IDs: ORCID: 0000-0002-8608-625X, Researcher ID: J-4236-2012

Total Publications: 19 publications (11 first, 4 corresponding, 3 covers)

Bibliometrics from: **ISI Web of Science** **Harzings Publish or Perish (Google Scholar)**

Citations: 814 1262

H-index: 15 17

Positions of Trust

2016 – **Adjunkt to Board of Research** (Styrelsen för forskning, FS) at Karolinska Institute
Research, Doctoral Education, and Undergraduate Education at KI fall under the governance of three boards. The Board of research has overall responsibility for research at KI, including strategy, ethics, and collaborations.

2016- **Member of StratNeuro Executive Board** at Karolinska Institute

The Swedish government identified prioritized research areas, denoted Strategic Research Areas (Strategiska Forskningsområden, SFOs) to which large grants were given. KI was

awarded funding for the strategic area Neuroscience (StratNeuro), and the executive board decides strategies to stimulate neuroscience, an area in which KI is already world-leading (24MSEK per year). This includes awarding project grants, core facility support, strategic recruitments, conference support and courses.

- 2016 – Chair of Junior Faculty Steering Group**, Karolinska Institutet
Junior Faculty (JF) is an interest organization, funded by Board of Research, of researchers with a PhD but not yet a permanent academic position as lecturer or professor. Our aim is to promote development of the career system and ensure the best science is performed; through participation in KI boards and dialogue with KI leadership, funding agencies and government. <https://internwebben.ki.se/en/junior-faculty-ki>
- 2016 - Elected Member of Departmental Board** (Institutionsrådet) at BioNut, KI.
2016 – Member of PhD student registration board at BioNut, KI.
2014 Member on the Board of Education at CMB, KI
2014-2015 Vice Chair of Junior Faculty Steering Group, KI
2007-2008 Institutional board member at MBB, KI
Member of PhD student registration board, MBB, KI

Workgroups

- 2016 - Workgroup for MOOC strategy** at KI
2016 - Workgroup for Behaviour core facility at BioMedicum, KI
2015 - Workgroup for ERC Grants Strategy at KI

Important international collaborations

Hans Clevers, Utrecht University, Netherlands, *Alagille syndrome organoid drug discovery screens*

Elaine Fuchs, Rockefeller University, USA, *Ultrasound-guided nano-injection for genetic manipulation in embryonic organs*

Jozef Kaiser, Central European Institutet of Technology, Czech Republic, *Novel technology for 3D visualization of biliary and vascular tree in liver using microCT*

Paul Tam, Hong Kong University, Hong Kong, *Studies of Alagille syndrome and biliary atresia*

Supervision of Students/Post Docs, organization of courses

Currently supervising 3 PhD students, 4 post docs, 2 technicians, and 1 core facility manager

- 2017 – present Principle supervisor to student, Afshan Iqbal**
PhD student Registration expected September 2017
- 2016 – present My lab has hosted 3 students in ERASMUS + program, with more coming**
- 2016 – Organizer of Doctoral Course “Stem Cell Niches”**
- 2014 – present Principle supervisor to PhD student, Katrin Mangold**
Registration 2015-06-04
- 2012-2015 Co-supervisor to PhD Student Simona Hankeova**
Registration: 2012-06-21, Half-time: 2013-12-13
Co-supervisor: Dr. Vitezslav Bryja, Masaryk University, Czech Republic
- 2011-present Co-supervisor to PhD Student Indira V. Chivukula**
Registration: 2009-07-01, Half-time: 2011-11-28, Defense: 2015-11-05
Principle Investigator: Prof Urban Lendahl, KI
- 2011-2013 Course Co-Director (with Christofer Uhde):**

Emma R Andersson, 810421-0300 (36 years old)
CMB and BioNut, Karolinska Institutet

emma.andersson@ki.se
www.anderssonlab.com

Concepts in Developmental Biology International Summer School, DBRM

2009 – 2014

Mentor to PhD student, Moritz Lübke,

Principle Investigator: Prof Patrik Ernfors, MBB, KI

2004-2009

Teaching Assistant (Ammanuens), responsible for:

Lipid Analysis Lab & Gas Chromatography, 232 hrs

Teaching medical & biomedical students

Parental Leave

1 year total: Child #1: Aug 2011 - Feb 2012 = ~6 months

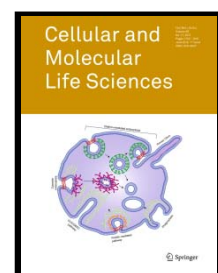
Child #2: Dec 2014 - April 2015 (at 75%), May -Aug (50%), Sept- Dec (25%) = ~6 months

Emma R Andersson Publications

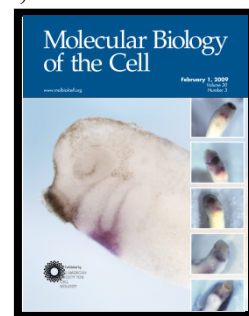
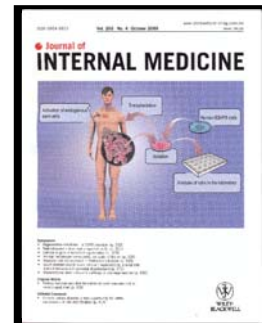
Total Publications:	18 publications
* First or Co-first:	11 publications
† Corresponding/last author:	4 publications
On the Cover:	3 publications
Manuscripts submitted, in revision	2 manuscripts

Bibliometrics from:	ISI Web of Science	Harzings Publish or Perish (Google Scholar)
Citations:	814	1262
H-index:	15	17

1. Sjöqvist M & Andersson ER[†], *Do as I say, Not(ch) as I do: lateral control of cell fate*, in revision with **Dev Biol** (Special Issue, Guest Editors: ER Andersson & J Bush)
2. Andersson ER^{†*}, Chivukula IV*, Hankeova S*, Sjöqvist M, Tsoi YL, Ramsköld D, Elmansuri A, Hoogendoorn A, Vazquez E, Storvall H, Netušilová J, Huch M, Fischler B, Ellis E, Contreras A, Nemeth A, Chien KC, Clevers H, Sandberg R, Bryja V, Lendahl U[‡], *A murine Jagged1 missense mutation recapitulates Alagille syndrome*, in revision with **Gastroenterology**
3. Masek J & Andersson ER[†], *The developmental biology of congenital Notch disorders*, **Development**, 2017; 144: 1743-1763; doi: 10.1242/dev.148007, PMID: 28512196
4. Andersson ER, Lendahl U, *Therapeutic modulation of Notch signalling— are we there yet?* requested review, **Nature Reviews Drug Discovery**, 2014, 13 (5): 357-78. PMID: 24781550
5. Main HM, Radenkovic J, Lendahl U, & Andersson ER[†], Notch regulates neural progenitor polarity in ES cell-derived neural rosettes and in embryonic nervous system development, **PLoS One**, 2014, 8 (5), e62959 PMID: 23675446
6. Jin S, Mutvei A, Chivukula IV, Andersson ER, Ramsköld D, Sandberg R, Lee KL, Kronqvist P, Mamaeva V, Ostling P, Mpindi JP, Kallioniemi O, Screpanti I, Poellinger L, Sahlgren C, Lendahl U, *Non-canonical Notch signaling activates IL-6/JAK/STAT signaling in breast tumor cells and is controlled by p53 and IKK α /IKK β* , **Oncogene**, 2013 Oct 10;32(41):4892-902 PMID: 23178494
7. Andersson ER^{*}, Salto C*, Villaescusa JC, Cajanek L, Yang S, Bryjova L, Nagy IL, Vainio SJ, Ramirez C, Bryja V, Arenas E, *Wnt5a cooperates with canonical Wnts to generate midbrain dopaminergic neurons in vivo and in stem cells*, **Proceedings of the National Academy of Sciences USA**, 2013, 110 (7) E602-10 PMID: 23324743
8. Kele J*, Andersson ER^{*}, Villaescusa JC*, Cajanek L, Parish CL, Bonilla S, Toledo EM, Bryja V, Rubin JS, Shimono A, Arenas E, *SFRP1 and 2 Dose-Dependently Regulate Midbrain Dopamine Neuron Development In vivo and in Embryonic Stem Cells*, **Stem Cells**, 2012 May; 30 (5):865-75. PMID: 22290867
9. Andersson ER, *The role of endocytosis in activating and regulating signal transduction*, Requested Review, **Cell Mol Life Sci.**, 2012 Jun;69(11):1755-71. PMID: 22113372 (**On the cover**)
10. Andersson ER, Sandberg R, Lendahl U, *Notch signaling: simplicity in design, versatility in function*, Requested Review, **Development**. 2011 Sep;138(17):3593-612. PMID: 21828089.



11. Das D, Lanner F, Main H, Andersson ER, Bergmann O, Sahlgren C, Heldring N, Hermanson O, Hansson EM and Lendahl U, *Notch induces cyclin-D1-dependent proliferation during a specific temporal window of neural differentiation in ES cells*, **Developmental Biology**, 2010 Dec 15;348(2):153-66. PMID: 20887720
12. Hansson EM, Lanner F, Das D, Mutvei A, Marklund U, Ericson J, Farnebo F, Stumm G, Stenmark H, Andersson ER[†], and Lendahl U[†], *Control of Notch ligand endocytosis by ligand-receptor interaction*, **Journal of Cell Science**, 2010 Sep 1;123(Pt 17):2931-42. PMID: 20720151
13. Mattsson CL, Andersson ER, Nedergaard J, *Differential involvement of caveolin-1 in brown adipocyte signaling: impaired beta3-adrenergic, but unaffected LPA, PDGF and EGF receptor signaling*, **Biochimica et Biophysica Acta - Molecular Cell Research**, 2010 PMID: 20381543
14. Andersson ER*, Bryjova L*, Biris K, Yamaguchi TP, Arenas E, & Bryja V, *Genetic interaction between Lrp6 and Wnt5a during mouse development*, **Developmental Dynamics**, 2010 Jan; 239(1):237-45. PMID: 19795512
15. Castelo-Branco G*, Andersson ER*, Minina E*, Sousa KM, Ribeiro D, Kokubu C, Imai K, Prakash N, Wurst W, & Arenas E, *Delayed dopaminergic neuron differentiation in Lrp6 mutant mice*, *Developmental Dynamics*, 2010 Jan; 239(1):211-21. PMID: 19795519
16. Andersson ER and Lendahl U, *Regenerative Medicine – a 2009 overview*, Requested Review, **Journal of Internal Medicine**, 2009 Oct, 266 (4), p303-310. PMID: 19765176. **(On the cover)**
17. Joseph B*, Andersson ER*, Vlachos P, Liu L, Teixeira AI, & Hermanson O; *p57Kip2 is a repressor of Mash1 activity and neuronal differentiation in neural stem cells.* **Cell Death and Differentiation**, 2009 Jul, 16, p1256-1265. PMID: 19590511
18. Bryja V*, Andersson ER*, Schambony A*, Esner M, Bryjová L, Biris KK, Hall AC, Kraft B, Yamaguchi TP, Buckingham M & Arenas E; *The extracellular domain of Lrp5/6 inhibits non-canonical Wnt signaling in vivo.* **Molecular Biology of the Cell**, 2009 Feb 20(3): p924-936. **(On the cover)**
19. Yang DH, Yoon JY, Lee SH, Bryja V, Andersson ER, Arenas E, Kwon YG & Choi KY; *Wnt5a is required for endothelial differentiation of embryonic stem cells and vascularization via pathways involving both Wnt/β-catenin and PKCα*, **Circulation Research**, 2009 Feb 13, 104(3): p372-379. PMID: 19096028
20. Andersson ER, Prakash N, Cajanek L, Minina E, Bryja V, Bryjova L, Yamaguchi TP, Hall AC, Wurst W & Arenas E; *Wnt5a regulates ventral midbrain morphogenesis and the development of dopaminergic precursors in vivo*, **PLoS One**, 2008 Oct 27, 3 (10), 14 pages. PMID: 18953410
21. Edman LC, Mira H, Erices A, Malmersjö S, Andersson E, Uhlén P, & Arenas E.; *Alpha-chemokines regulate proliferation, neurogenesis, and dopaminergic differentiation of*



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ventral midbrain precursors and neurospheres, **Stem Cells**, 2008 Jul, 26(7):1891-900.
PMID: 18436867