

Dr. Ariel Alejandro Bazzini

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Post-transcriptional gene regulation in vertebrates

We are passionate about understanding how genes are regulated and how that regulation can impact development or affect human diseases. We seek to understand what dictates the stability and the level of translation of messenger RNA (mRNA) in vertebrates.

Positions

- 2021- Associate Investigator, Stowers Institute for Medical Research.
- 2017-present Assistant Investigator, Department of Molecular Integrative Physiology, KU Medical Center.
- 2016-2020 Assistant Investigator, Stowers Institute for Medical Research.
- 2013-2016 Associate Research Scientist in Dr. Antonio J. Giraldez lab. Yale University. New Haven, USA.
- 2010-2013 Postdoctoral Fellow, in Dr. Antonio J. Giraldez lab. Yale University. New Haven, USA.
- 2009 Short stay in Alisdair N. Fernie lab. Max Planck Institute of Molecular Plant Physiology. Gölm, Germany.
- 2008-2009 Postdoctoral Research, in Dr. Sebastian Asurmendi lab. National Institute of Agriculture Technology (INTA), Biotechnology Institute, Castelar, Argentina.
- 2003-2007 Ph.D. in Dr. Sebastian Asurmendi lab. INTA, Biotechnology Institute and University of Buenos Aires, Argentina.
- 2003-2004 Invited Scientist to the Dr. Roger N. Beachy lab. Donald Danforth Plant Science Center, MO, USA.
- 2001-2003 M.S with Dr. Cecilia Vazquez-Rovere in Dr. Esteban Hopp lab, INTA and University of Buenos Aires, Argentina.

Honors and Grants

- 2021- Permanent member of the MGB study section (NIH)
- 2020-2025 NIH-R01, NIGMS, GM136849
- 2019-2021 Pew Innovation fund award
- 2010-2012 The Pew Latin American Fellowship. Program in the Biomedical Sciences
- 2012 Outstanding presentation award. 7th Microsymposium on Small RNAs, Basel, Switzerland.
- 2011 Keystone meeting fellowship. NIH Health, Grant #1R13HD069083-01.
- 2009 Galicia Bank and La Nacion newspaper Award. Best research work, Argentina.
- 2009 EMBO short-term fellowship, Germany.
- 2008-2010 CONICET Postdoctoral fellowship, Argentina. Not accepted.
- 2007-2009 CONICET PhD fellowship type II, Argentina.
- 2007 Ezio Emiliani Award. Best biotechnology PhD thesis. Litoral University, Argentina.
- 2006 Pérez Companc Foundation Award. Best research work, Argentina.
- 2005-2007 CONICET PhD fellowship type I, Argentina.
- 2003-2005 PICT fellowship, Argentina.

Selected publications

1. Diez M., Medina-Muñoz S.G., Castellano L.A., da Silva Pescador G., Wu Q., **Bazzini A.A. ‡**. iCodon: ideal codon design for customized gene expression. **Scientific Report**. 2022. Jul 15;12(1):12126. doi: 10.1038/s41598-022-15526-7. PMID: PMC9287306.
2. Tornini V, Lee, Miao L, Tang Y, Dube S, Gerson T, Schmidt V, Du K, Kuchroo M, Kroll F, Vejnar C, **Bazzini A**, Krishnaswamy S, Rihel J, Giraldez A. linc-mipep and linc-wrb encode micropeptides that regulate chromatin accessibility in vertebrate-specific neural cells. **bioRxiv**, 2022.
3. Mudge JM, Ruiz-Orera J, Prensner JR, Brunet MA, Calvet F, Jungreis I, Gonzalez JM, Magrane M, Martinez TF, Schulz JF, Yang YT, Albà MM, Aspden JL, Baranov PV, Bazzini AA, Bruford E, Martin MJ, Calviello L, Carvunis AR, Chen J, Couso JP, Deutsch EW, Flicek P, Frankish A, Gerstein M, Hubner N, Ingolia NT, Kellis M, Menschaert G, Moritz RL, Ohler U, Roucou X, Saghatelian A, Weissman JS, van Heesch S. Standardized annotation of translated open reading frames. **Nature Biotechnology**. 2022 Jul;40(7):994-999. doi: 10.1038/s41587-022-01369-0. PMID: 35831657
4. L. Hernandez-Huertas, G. Kushawah, A. Diaz-Moscoso, L. Tomas-Gallardo, I Moreno-Sanchez, G. da Silva Pescador, **A.A. Bazzini‡**, M.A. Moreno-Mateos‡. Optimized CRISPR-RfxCas13d system for RNA targeting in zebrafish embryos. **STAR Protoc**. 2021 Dec 23;3(1):101058. doi: 10.1016/j.xpro.2021.101058. eCollection 2022 Mar 18. PMID: 35005640
5. S.G. Medina-Muñoz, M. Diez, L.A. Castellano, G. da Silva Pescador, Q. Wu, **A.A. Bazzini ‡**. iCodon: ideal codon design for customized gene expression. **bioRxiv**. 2021 doi: <https://doi.org/10.1101/2021.05.06.442969>
6. S.G. Medina-Muñoz, G. Kushawah, L.A. Castellano, M. Diez, M.L. DeVore, M.J.B. Salazar, **A.A. Bazzini ‡**. Crosstalk between codon optimality and cis-regulatory elements dictates mRNA stability. **Genome Biol**. 2021 Jan 5;22(1):14. doi: 10.1186/s13059-020-02251-5.
7. Q. Wu, M. Wright, M.M. Gogol, W.D. Bradford, N. Zhang N, **A.A. Bazzini ‡**. Translation of small downstream ORFs enhances translation of canonical main open reading frames. **EMBO J**. 2020 Aug 3:e104763. doi: 10.15252/emj.2020104763.
8. G. Kushawah, L. Hernandez-Huertas, J. Abugattas-Nuñez del Prado, J.R. Martinez-Morales, M.L. DeVore, H. Hassan, I. Moreno-Sanchez, L. Tomas-Gallardo, A. Diaz-Moscoso, D.E. Monges, J.R. Guelfo, W.C. Theune, E. Brannan, W. Wang, T.J. Corbin, A.M. Moran, A. Sánchez Alvarado, E. Málaga-Trillo, C.M. Takacs, **A.A. Bazzini ‡**, M.A. Moreno-Mateos ‡. CRISPR-Cas13d induces efficient mRNA knock-down in animal embryos. **Dev Cell**. 2020 Aug 1:S1534-5807(20)30587-6. doi: 10.1016/j.devcel.2020.07.013.
9. Q. Wu, S.G. Medina, G. Kushawah, M.L. DeVore, L.A. Castellano, J.M. Hand, M. Wright, **A.A. Bazzini ‡**. Translation affects mRNA stability in a codon dependent manner in human cells. **Elife**. 2019 Apr 23;8. pii: e45396. doi: 10.7554/eLife.45396.
- 10- **A.A. Bazzini‡**, F. del Viso, M.A. Moreno-Mateos, T.G. Johnstone, C.E. Vejnar, Y. Qin, J. Yao, M.K. Khokha and A.J. Giraldez‡. Codon identity regulates mRNA stability and translation efficiency during the maternal-to-zygotic transition. **EMBO J**. 2016 Oct 4;35(19):2087-2103
11. **A.A. Bazzini#‡**, T.G. Johnstone#, R. Christiano, S.D. Mackowiak, B. Obermayer, E.S. Fleming, C.E. Vejnar, M.T. Lee, N. Rajewsky‡, T.C. Walther, A.J. Giraldez‡. Identification of small ORFs in vertebrates using ribosome footprinting and evolutionary conservation. **EMBO J**. 2014 May 2;33(9):981-93.
12. **A.A. Bazzini#**, M.T. Lee#, A.J. Giraldez. Ribosome profiling shows that miR-430 reduces translation before causing mRNA decay in zebrafish. **Science**. 2012 Apr 13;336(6078):233-7.
13. **A.A. Bazzini**, H.E. Hopp, R.N. Beachy, and S. Asurmendi. Infection and coaccumulation of tobacco mosaic virus proteins alter microRNA levels, correlating with symptom and plant development. **Proc Natl Acad Sci USA**. 2007 Jul 17;104 (29):12157-62.

All peer-reviewed

17. Brd4 and P300 Confer Transcriptional Competency during Zygotic Genome Activation. Chan SH, Tang Y, Miao L, Darwich-Codore H, Vejnar CE, Beaudoin JD, Musaev D, Fernandez JP, Benitez MDJ, **Bazzini AA**, Moreno-Mateos MA, Giraldez AJ. *Dev Cell*. 2019 Jun 17;49(6):867-881.e8.
16. Systems to study codon effect on post-transcriptional regulation of gene expression. Wu Q, **Bazzini AA**†. *Methods*. 2018 Mar 15;137:82-89. doi: 10.1016/j.ymeth.2017.11.006.
15. Poly(A) tails: longer is not always better. Castellano LA, **Bazzini AA**†. *Nat Struct Mol Biol*. 2017 Dec 7;24(12):1010-1011. doi: 10.1038/nsmb.3509.
14. JM, Hand, AA, **Bazzini AA**†. When LIN41 Comes to a Fork in the Road, It Takes BOTH Paths: Translational Repression OR mRNA Decay, Depending on the Target Site Position. *Mol Cell*. 2017 Feb 2;65(3):375-377. doi: 10.1016/j.molcel.2017.01.018.
13. C.E. Vejnar, M.A. Moreno-Mateos, D. Cifuentes, **A.A. Bazzini** and Antonio J. Giraldez. Optimized CRISPRCas9 system for genome editing in zebrafish. *Cold Spring Harbor Protocol*. 2016 Oct 3;2016(10).
12. T.G. Johnstone, **A.A. Bazzini** and A.J. Giraldez. Upstream ORFs act as prevalent translational repressors in vertebrates. *EMBO J*. 2016 Apr 1;35(7):706-23.
11. C.A. Reyes, E.E Ocolotobiche, F Marmisollé, G Robles Luna, M Borniego, **A.A Bazzini**, S Asurmendi, M.L García. Citrus psorosis virus 24K protein interacts with citrus miRNA precursors, affects their processing and subsequent miRNA accumulation and target expression. *Mol Plant Pathol*. 2015 May 29.
10. M.T. Lee[#], A.R. Bonneau[#], C.M. Takacs, **A.A. Bazzini**, K.R. DiVito, E.S. Fleming, A.J. Giraldez. Nanog, Pou5f1 and SoxB1 activate zygotic gene expression during the maternal-to-zygotic transition. *Nature*. 2013 Nov 21;503(7476):360-4.
9. **A.A. Bazzini**, C.A. Manacorda, T. Tohge, G. Conti, M.C. Rodriguez, A. Nunes-Nesi, S. Villanueva, A.R. Fernie, F. Carrari, S. Asurmendi. Metabolic and miRNA profiling of TMV infected plants reveals biphasic temporal changes. *PLoS One*. 2011;6(12):e28466.
8. **A.A. Bazzini** and A.J. Giraldez. MicroRNAs sculpt gene expression in embryonic development: new insights from plants. *Dev Cell*. 2011 Jan 18;20(1):3-4. Review
7. **A.A Bazzini**[#], R Asís[#], V González, S Bassi, M Conte, M Soria, A.R Fernie, S Asurmendi, F Carrari. miSolRNA: A tomato micro RNA relational database. *BMC Plant Biol*. 2010 Nov 8;10:240.
6. **A.A Bazzini**, N.I. Almasia, C.A. Manacorda, V.C. Mongelli, A.J. Distéfano, G.A. Maroniche, M.C. Rodriguez, G Conti, H.E. Hopp, M del Vas and S Asurmendi. Virus infection alters transcriptional activity of miR164a promoter in plants. *BMC Plant Biol*. 2009 Dec 30;9:152.
5. N.I. Almasia, **A.A. Bazzini**, H.E. Hopp and C. Vazquez-Rovere. Overexpression of snakin-1 gene enhances resistance to *Rhizoctonia solani* and *Erwinia carotovora* in transgenic potato plants. *Molecular Plant Pathology*. 2008 9 (3), 329–338.
4. M Bendahmane, I Chen, S Asurmendi, **A.A Bazzini**, J Szecsi and R.N. Beachy. CP-MR to TMV infection of *Nicotiana tabacum* involves multiple modes of interference by coat protein. *Virology*. 2007 366:107-16.
3. **A.A. Bazzini**, V.C. Mongelli, H. E. Hopp, M. del Vas and S. Asurmendi. A practical approach to the understanding and teaching of RNA silencing in plants. *Electronic journal of Biotechnology*. **Elect J Biotechnol**, 2007 April 15 DOI:10.2225/vol10-issue2-fulltext-11
2. **A.A. Bazzini**, H. E. Hopp, R. N. Beachy, and S. Asurmendi. Posttranscriptional Gene Silencing Does Not Play a Significant Role in Potato virus X Coat Protein Mediated Resistance. *Phytopathology*. 2006 Nov 96 (11): 1175-8.
1. **A.A. Bazzini**, S. Asurmendi, H.E. Hopp, R.N. Beachy. Tobacco mosaic virus (TMV) and potato virus X (PVX) coat proteins confer heterologous interference to PVX and TMV infection, respectively. *J Gen Virol*. 2006 Apr;87(Pt 4):1005-12.

Books

A.A. Bazzini‡ and S. Asurmendi. Effects of Virus Infection on Transcriptional Activity of miR164a in Plants. Non Coding RNAs in Plants. Jan (Eds.) 1st Edition., 2011, XVII. 359-373.

‡ Corresponding authors. # Co-authors

Talks

- 2022 Meeting of RNA society of Japan. Japan, ZOOM, Jun 19-23
- 2022 FASEB, The Post-transcriptional Control of Gene Expression. Palm Beach FL, USA, Jun 19-23
- 2022 Center for Integrative Biology, Universidad Mayor, Chile, ZOOM, May 27
- 2022 KU Cancer Center, Kansas City, MO, US, May 17
- 2022 Conference, Sinaloa, Mexico, ZOOM, May 13
- 2022 Protein Folding on the Ribosome, Baltimore, US, May 1-3
- 2022 Codon usage EMBO workshop, Edinburgh, UK, April 8-11
- 2021 SAB XXIII, CRISPR course, Argentina, ZOOM, Nov 30
- 2021 Brandeis University, MA, USA, Nov 2
- 2021 Cellular Biology, UBA-Exactas, ZOOM, Sep 13
- 2021 Advanced course: genome editing. Conicet-UNSAM, April 21
- 2021 Translational Research Seminar, Kansas city, ZOOM, Feb 4
- 2020 Instituto de Biología Molecular y Celular de Rosario, Argentina, ZOOM, Oct 2
- 2020 Vienna Biocenter PhD Program, ZOOM, Sep 14
- 2020 Society for Developmental Biology meeting, ZOOM, July 9-15
- 2020 Mc Gill, UTRs workshop, Barbados, Jan 17-24
- 2019 SAIB, Salta, Argentina, Nov 7
- 2019 INTA, Castelar, Argentina, Nov 4
- 2019 RNA club, Instituto Lelior, Buenos Aires, Argentina, Nov 1
- 2019 LASDB, Buenos Aires, Argentina, Oct 29
- 2019 Lexogen, Webinar, June 26
- 2019 CABD, Seville, Spain, May 21
- 2019 EMBO Workshop, Awakening of the genome: the MZT, Prague, Czech Republic, May 15-18
- 2019 NCI, NIH, Rockville, USA, April 17-18
- 2019 Columbia University, New York, USA, March 4
- 2018 FASEB, Phoenix, USA, June 25-29
- 2018 Career Discussion Workshop. FASEB, Phoenix, USA, June 25-29
- 2018 Organized Gene Regulation and Epigenetic workshop, Internat. Zebrafish Society, Madison, June 21
- 2018 RNA Workshop, Argentina April 22-25
- 2017 Kansas State University, Division of Biology, USA. Nov 17.
- 2017 ASBMB, Evolution and Core Processes in Gene expression. Kansas city, USA, July 13-17.
- 2017 UNAM, Mexico City, Mexico, April 5.
- 2017 Frontiers in Genomics UNAM, Cuernavaca, Mexico, April 4.
- 2016 FCEN UBA, Argentina. Dic 22.
- 2016 INTA, Argentina. Dic 19.
- 2016 University of Kansas Medical Center, KUMC, USA. Dic 9.
- 2016 University of Oregon, USA. Nov 4.
- 2016 Translational regulation meeting. CSH Laboratory, USA. Sept 6-10.
- 2016 Drexel University, USA, Feb 23.
- 2016 Stowers Institute for Medical Research, USA, Feb 8.
- 2016 University of Albany, USA, Feb 4.
- 2016 University of California-Irvine, USA, Jan 26.
- 2016 University of Michigan, USA, Jan 19.
- 2016 University of Massachusetts, Worcester, USA. Jan 14.
- 2016 Duke University, USA. Jan 4.
- 2015 National Institute of Health, NIH, USA. Dic 4.

2015 Yale University, USA. Sept 18.
 2015 EMBL meeting. Heidelberg, Germany. Sept 9-13.
 2015 Eukaryotic mRNA processing meeting. CSH Laboratory, USA. Aug 21.
 2015 Duke University, USA. Feb 11.
 2015 Washington University in St. Louis, USA. Jan 22.
 2015 Cornell University, USA. Jan 13.
 2014 Fundacion Instituto Leloir, Argentina, Dec 15.
 2014 University of Connecticut, USA. July 30.
 2014 Illumina St. Louis User Group Meeting, USA, Nov 12.
 2014 CT Illumina Sequencing User Meeting, USA, Nov 5.
 2014 Translational Control meeting. Cold Spring Harbor Laboratory, USA. Sep 2-6.
 2013 San Martin University. Argentina. Dec 18.
 2013 Biotech. Inst., INTA, Argentina. Dec 15th.
 2013 Yale University, USA, March 5.
 2012 Biotech. Inst., INTA, Argentina June 7th.
 2012 7th Microsymposium on Small RNAs, Basel, Switzerland. May 21-23.
 2012 New England RNA Data club, Harvard University, USA. Apr 19.
 2012 PEW Annual Meeting, Mexico, March 16-22.
 2012 Yale University, USA. Jan 11st.
 2011 EMBL Heidelberg, Germany. Sept 7-11.
 2008 Hospital Italiano, Buenos Aires, Argentina.
 2008 Hematology department of the Hospital Italiano, Buenos Aires, Argentina.
 2008 Advance Summer School on The Molecular and Cellular Basis of Infection, Cape Town, South Africa.
 2007 SAIB, Argentina.

Reviewer for journals, fellowship and grants

EMBO J, Dev Cell, Cell Reports, Nature Structural & Molecular Biology; PNAS; Methods; Trends in Cell Biology; Nature Methods; Genome Biology; RNA; Trends in Genetics; Nature protocol; Nature Communication; Development; Genome Research; Nucleic Acids Research, Bioinformatics; Gene; FEBS letters, Molecular Plant-Microbe Interaction (MPMI); Transcription; Gene to cells; Life; Proteomics; Non-coding RNA; Journal of Agricultural Science and Technology; Journal of Ecology and the Natural Environment; Plant Physiology; Agencia Nacional de Promoción de Ciencia y Tecnología and Human Frontier Science Program (HFSP).
 Served in the MGB study section.

Mentoring

Current Members

2022-present Francisco Jose Gerra Garvia, Research Technician, Stowers Institute.
 2022-present Erika Pintos, Research Technician, Stowers Institute.
 2022-present Maria Blanco Salazar, Predoctoral Researcher, Graduate School of the Stowers Institute
 2021-present Cameron Berry, Postdoctoral Researcher, Stowers Institute.
 2021-present Anthony Treichel, Predoctoral Researcher, Graduate School of the Stowers Institute
 2020-present Gabriel da Silva Pescador, Predoctoral Researcher, Graduate School of the Stowers Institute
 2020-present Danielson Baia Amaral, Predoctoral Researcher, Graduate School of the Stowers Institute
 2018-present Gopal Kushawah , Postdoctoral Researcher, Stowers Institute.
 2017- present Luciana Castellano, Predoctoral Researcher, Graduate School of the Stowers Institute
 2016- present Michelle DeVore, Predoctoral Researcher, Open Universtiy, Stowers Institute

Former members

2017- 2022 Qiushuang Wu, Predoctoral Researcher, Graduate School of the Stowers Institute

She was awarded with F99/K00 NIH/NCI

Qiushuang Wu is doing her post-doctoral train at The Rockefeller University.

2019-2022 Michay Diez, Research Technician, Stowers Institute

2020-2022 Ryan McNamara, Bioinformatician, Stowers Institute

2021- 2022 Lydia McLaughlin, Senior Administrative Assistant, Stowers Institute

2021- 2022 Shanaika Vargas, Research Scholar, Stowers Institute

2021- 2022 Rene Wong, Bioinformatician, Stowers Institute\

2017- 2020 Santiago Medina Munoz, Bioinformatician, Stowers Institute.
Santiago is stating his PhD in the Universtiy opf Mexico.

2020 Liz Humphrey, administrative assistant

2019 Majo Pascual, Graduate School Summer Scholar.

2019 Maria Jose Blanco, Graduate School Summer Scholar.
She recently accepted to be part of 2021 class, Graduate School of the Stowers Institute

2018 Matthew Wright, Computational Biology Internship, University of Oregon

2018 Luciana Ramirez Navarro, Graduate School Summer Scholar

2018 Isidora, Stankovic, Graduate School Summer Scholar

2016-18 Jacqelyn M Hand, Postdoctoral Researcher, Stowers Institute.
She is currently working in the Children's Mercy Hospital.

2017 Amina Zemouri, Graduate Researcher, Paris Diderot University

2017 Elise Viode, Graduate School Summer Scholar, Pierre et Marie Curie University, Paris

2017 Shivani Sharma, Research Technician I