# Adrian Angel Mutto, Bs.C., Ms.C., Ph.D.

Lab. Biotechnology of Animal Reproduction  
Institute of Research in Biotechnology

National University of San Martin  
Av.25 de Mayo y Francia, Campus UNSAM  
San Martín, Buenos Aires, Argentina  
(+5411) 40061500   
[aamutto@gmail.com](mailto:aamutto@gmail.com)

[amutto@iibintech.com.ar](mailto:amutto@iibintech.com.ar)

amutto@unsam.edu.ar

**ACADEMIC DEGREES**

**PhD in Biotechnology and Molecular Biology**. **Specialty: Animal Reproduction** Universidad Nacional de San Martín (UNSAM), Buenos Aires, Argentina, 2009.

Score: 10 (on a scale of 1 to 10),

Honors: *SUMMA CUM LAUDE*.

Title of thesis: “**Cloning and Transgenesis in Animals of Zootechnical Interest by Nuclear Transfer**”, Instituto Tecnológico de Chascomús (INTECH), Instituto de Investigaciones Biotecnológicas (IIB), Universidad Nacional de San Martín (UNSAM), National Council of Scientific and Technical Research (CONICET), Buenos Aires, Argentina; Group of Reproductive Biotechnology, Department of Animal Production, Instituto de Tecnología Agropecuaria (INTA), Balcarce, Argentina.

**Bachelor's Degree in Biotechnology**

Universidad Nacional de San Martín (UNSAM), Buenos Aires, Argentina, 2003.

Average score: 8.98 (on a scale of 1 to 10).

Degree thesis. Topic: "**Development of a Diagnostic system for *Tritrichomonas foetus* and *Campilobacter fetus venerealis* in preputial washings of bulls by PCR**". Instituto de Investigaciones Biotecnológicas (IIB), Universidad Nacional de San Martín (UNSAM), 2002-2003. Awarded a fellowship from the Technological Pole of Universidad Nacional de San Martín (UNSAM). Grant duration: 1 year.

**WORK EXPERIENCE ABROAD**

Equine Somatic Cell Nuclear Transfer (SCNT), VIAGEN INC.

Lethbridge, Calgary, Canada; January-April, 2009, June-August 2010

Genome Editing Technology, Department of Animal Sciences, Davis, University of California, USA. Dr Paul Ross, Assistant Professor; july 2013-September, 2014

**MANAGEMENT AND POSITIONS HELD**

**COO, Co-founder and Director of CrofaBiotech SA, Biomedical Solutions for Human Health, Company specialized in solutions in response to chronic illnesses in human health through genomic modification of pigs as a biotechnological platform.**

**Executive Director of CrestView Farm, Equine Biotechnology Reproduction Center, SCNT, ICSI, ET, AI, Cryopreservation (embryos and semen) services, Aiken, South Carolina, US, Jan 2017-Today**

**CEO-Scientific Director of Hayah LLC Veterinarian Sciences and Advanced Scientific group, Camel and Horse Reproduction Center, SCNT, CRISPR/Cas9 in Camels, ICSI, ET, AI, Mesenchymal Stem Cells services, Cryobank, Abu Dhabi, UAE, July 2018- today**

**Executive Director of the Ovine Biotechnology Center** (INTECH), Chascomús, Buenos Aires, Argentina, in the framework of the project “Post-emergence of the Northern Patagonia region” 2010-present.

**Full-time Asociate Professor in the subject Animal Biotechnology** of the Bachelor’s Degree in Biotechnology of the Universidad Nacional de San Martín, (2012-present).

**Full-time Chief of practical work in the subject Animal Biotechnology** of the Bachelor’s Degree in Biotechnology of the Universidad Nacional de San Martín, Argentina (2009-present).

**First Assistant, interim, simple dedication, in the subject Animal Biotechnology** of the Bachelor’s Degree in Biotechnology of the Universidad Nacional de San Martín, Argentina (2004-2009).

**Full-time Chief of practical work in the subject Methods of Biomedical Analysis** of the Bachelor’s Degree in Biotechnology of the Universidad Nacional de San Martín, Argentina (2009-present).

**First Assistant, interim, simple dedication, in the subject Methods of Biomedical Analysis** of the Bachelor’s Degree in Biotechnology of the Universidad Nacional de San Martín, Argentina (2004-2009).

**Invited Professor in the subject Genetics** of the Bachelor’s Degree in Biotechnology of the Universidad Nacional de San Martín, Argentina

**Professor in the Department of Teriogenology**, Faculty of Veterinary Medicine, University of Buenos Aires, Argentina.

**Professor of the master's degree in Veterinary Anatomy and Physiology**, course on Reproductive Physiology in domestic animals. Faculty of Veterinary Medicine, Universidad Nacional de Río Cuarto, Córdoba, Argentina.

**Professor of the master's degree in Reproductive Physiology in Domestic Animals**, **Biotechnology applied to Reproduction in Ruminants**, Faculty of Veterinary Medicine, Universidad Nacional de Río Cuarto, Córdoba, Argentina.

**Professor of the master's degree in Equine Production**, Faculty of Veterinary Medicine of the Universidad Nacional de Río Cuarto, Córdoba, Argentina

http://www.ayv.unrc.edu.ar/POSGRADOS/Maestria-en- Produccion%20Equina/Maestria-En-Produccion-Equina.html

**Professor of the subject Reproduction and Reproductive Management**, of the master’s degree in Animal Production, Faculty of Agronomy of the University of Buenos Aires, Argentina

[maestria.prod.animal@agro.uba.ar](mailto:maestria.prod.animal@agro.uba.ar)

**Professor of the master's degree in Animal reproduction**, Faculty of Agricultural Sciences of the University of Cuenca, Ecuador.

**HUMAN RESOURCES TRAINING**

**Training of Degree students**

**Advisor of PhD Thesis of 12 graduate students**

Universidad Nacional de San Martín (UNSAM), Buenos Aires, Argentina.

**Advisor of postdoctoral scholarship**

Universidad Nacional de San Martín (UNSAM), Buenos Aires, Argentina.

**Training of Master students**

**Advisor of Master thesis of 11 students**.

**Training of post-doctoral students**

**Director of postdoctoral fellowship of Dr Carolina Bluggerman** (fellowship of the National Council of Scientific and Technical Research (CONICET))

Topic: Generation of equine induced pluripotent cells and their subsequent differentiation to chondrocytes for application in regenerative therapies in the treatment of injuries.

2015-present

**Director of postdoctoral scholarship of Dr Nicolás Ortega** (fellowship of the National Council of Scientific and Technical Research (CONICET)).

Topic: Production of farm animals genetically modified by genome editing tools.

2015-present

**PRODUCTION IN TEACHING**

**Books**

Title: Biotechnology applied to the reproduction and animal genetic improvement.

Sub title: Nuclear transfer and Transgenesis in animals of zootechnical interest, Author: Adrián Mutto

Publisher: AV Akademikerverlag GmbH Co. KG.

ISBN: 978-3-8465-7792-9

Title: Genetic improvement in animals of zootechnical interest

Author: Adrián Mutto

Publisher: UNSAM edita, ISBN: 978 - 987-1788-17-0, accepted

**ONGOING MAIN RESEARCH PROJECTS**

PICT2016-SERIEA-1248: Generation of a Biotechnological platform for the production of edited cattle and pigs through the application of CRIPSRS/Cas9, 2015-today

PICT 2020-SERIEA-00077: Development and applications of *in vitro* gametogenesis in domestic animals

PICT-2021-I-A-00084 - *In vitro* gametogenesis: Biotechnological instrument applied to livestock production

*In vitro* beef production by multipotent stem cells, GTA foundation, 2020-2023

# Studies in Intermediate Pluripotent Stem Cells Amenable to Primordial Germ Cell Specification, in cooperation with Ross Lab, Animal Sciences Institute UCDavis; Wu lab, School of medicine, Texas University SW.

Molecular, cellular and differentiation potential studies of Endogenous Reparative Pluripotent Stem Cells (MUSE) for biotechnological applications and their use in reparative therapies

Production of insulin-producing cells (hβ-Cells) derived from hiPSc, Supported by Crest View Foundation, Fort Worth, Texas, US.

Production of myostatin gene knock out racing camels by CRISPRS/Cas9 and SCNT, Supported by Royal Group, ABU DHABI, UAE.

Biotechnological platform to produce genetically modified pigs as a model for heart and kidney xenotransplant and pigs as a model for the study of human hereditary diseases. Supported by Ministry of Sciences, ANMAT, Isowean SRL, Argentine society of transplants, and Bioceres.

**PUBLICATIONS SUBMITTED TO DATE**

Mutto A.; Giambiaggi S; Angel SO. **PCR detection of *Tritrichomonas foetus* in preputial bull fluid without prior DNA isolation**. 2005. Veterinary Parasitology 136; 357-361.

Cesari A Kaiser GG, Mucci N, Mutto A,Vincenti A, Fornés MW, & Alberio RH. **Integrated morphophysiological assessment of two methods of sperm selection for bovine *in vitro* embryo production**. 2006. Theriogenology, 66,(5) 1185-1193

Mutto A; Kaiser GG; Mucci N; Hozbor F; Sanchez E; Ugalde R; Alberio RH **Transgénesis y clonado: Humanización de la leche de cabra**. Revista Taurus de Reproducción Animal. 2008, 10 (37).

Mutto A., Kaiser G., Mucci N., Alberio R., Ugalde R. **Mammary gland as a model to test the *in vitro* expression of tissue specific vectors**. Revista de Archivos de Medicina Veterinaria. UaCH, in press.

Mutto A., Kaiser G., Mucci N., Alberio R., Ugalde R. **Production of transgenic goats by SCNT: First attempt in Argentina**. Transgenic research. submitted.

Palma GA, Argañaraz ME, Barrera DA, Rodler D, Mutto AA, Miceli DA; Sinowatz F. **Biology and Biotechnology of Early Follicle Development: a Review**. Review, The Scientific World Journal, volume 2012, art ID 938138

Canepa MJ, Ortega N, Mucci N, Kaiser G, Monteleone M, Brocco M and **Mutto A**. **Expression Profile of Genes as Indicators of Developmental Competence and Quality of *in vitro* Fertilization and Somatic Cell Nuclear Transfer Bovine**

**Embryos**. PLoS One. 2014 Sep 30;9(9):e108139. doi:

10.1371/journal.pone.0108139. eCollection 2014.

N. Mucci , **A. Mutto**, J. F. Aller, R. Alberio, F. Hozbor, D. Montiel, S. Wacholder, G. G. Kaiser. 2014. **Intensive neonatal care of the first bitransgenic bovine clone for human lysozyme and lactoferrin production**. Obstetric Journal & Obstetric Disorders. Article on line at <http://omicsonline.org/open-access/intensive-neonatal-care-of-the-first-bitransgenic-bovine-clone-for-human-lysozyme-and-lactoferrin-production-2161-038X-3-137.php?aid=28116>

Mucci, N., Kaiser, G., **Mutto, A.** 2014. **Aspectos neonatológicos en terneros**

**considerados de alto riesgo, producidos por fecundación in vitro y clonación**. Revisión bibliográfica y reporte de un caso. Taurus Año 16 Nº 62 14-25.

Herrera C, Morikawa MI, Castex CB, Pinto MR, Ortega N, Fanti T, Garaguso

R, Franco MJ, Castañares M, Castañeira C, Losinno L, Miragaya MH, Mutto AA. **Blastocele fluid from in vitro- and in vivo-produced equine embryos contains nuclear DNA**, Theriogenology. 2015 Feb;83(3):415-20. doi: 10.1016/j.theriogenology.2014.10.006. Epub 2014 Oct 13.

[Detection of recombinant human lactoferrin and lysozyme produced in a bitransgenic cow.](https://pubmed.ncbi.nlm.nih.gov/28109583/)

Kaiser GG, Mucci NC, González V, Sánchez L, Parrón JA, Pérez MD, Calvo M, Aller JF, Hozbor FA, **Mutto AA.**J Dairy Sci. 2017 Mar;100(3):1605-1617. doi: 10.3168/jds.2016-11173. Epub 2017 Jan 18.PMID: 28109583.

[Derivation of Intermediate Pluripotent Stem Cells Amenable to Primordial Germ Cell Specification.](https://pubmed.ncbi.nlm.nih.gov/33271070/)

Yu L, Wei Y, Sun HX, Mahdi AK, Pinzon Arteaga CA, Sakurai M, Schmitz DA, Zheng C, Ballard ED, Li J, Tanaka N, Kohara A, Okamura D, **Mutto AA**, Gu Y, Ross PJ, Wu J.Cell Stem Cell. 2021 Mar 4;28(3):550-567.e12. doi: 10.1016/j.stem.2020.11.003. Epub 2020 Dec 2.PMID: 33271070

[Evaluation of α5β1 integrin as a candidate marker for fertility in bull sperm samples.](https://pubmed.ncbi.nlm.nih.gov/33862426/)

Castellano L, Arroyo-Salvo CA, Chiarante N, Alonso CAI, Lottero-Leconte RM, Vernaz ZJ, Navarro M, **Mutto A**, Osycka-Salut C, Ribeiro ML, Perez-Martinez S.Theriogenology. 2021 Jul 1;168:66-74. doi: 10.1016/j.theriogenology.2021.04.001. Epub 2021 Apr 3.PMID: 33862426

[Superovulation, embryo recovery, and pregnancy rates from seasonally anovulatory donor mares treated with recombinant equine FSH (reFSH).](https://pubmed.ncbi.nlm.nih.gov/31711702/)

Roser JF, Etcharren MV, Miragaya MH, **Mutto A**, Colgin M, Losinno L, Ross PJ.Theriogenology. 2020 Jan 15;142:291-295. doi: 10.1016/j.theriogenology.2019.10.030. Epub 2019 Oct 29.PMID: 31711702

[Effects of In Vitro Interactions of Oviduct Epithelial Cells with Frozen-Thawed Stallion Spermatozoa on Their Motility, Viability and Capacitation Status.](https://pubmed.ncbi.nlm.nih.gov/33401609/)

Gimeno BF, Bariani MV, Laiz-Quiroga L, Martínez-León E, Von-Meyeren M, Rey O, **Mutto AÁ**, Osycka-Salut CE.Animals (Basel). 2021 Jan 3;11(1):74. doi: 10.3390/ani11010074.PMID: 33401609

[Extracellular cAMP activates molecular signalling pathways associated with sperm capacitation in bovines.](https://pubmed.ncbi.nlm.nih.gov/28521061/)

Alonso CAI, Osycka-Salut CE, Castellano L, Cesari A, Di Siervi N, **Mutto A**, Johannisson A, Morrell JM, Davio C, Perez-Martinez S.Mol Hum Reprod. 2017 Aug 1;23(8):521-534. doi: 10.1093/molehr/gax030.PMID: 28521061

[CRISPR-on system for the activation of the endogenous human INS gene.](https://pubmed.ncbi.nlm.nih.gov/27052801/)

Giménez CA, Ielpi M, **Mutto A**, Grosembacher L, Argibay P, Pereyra-Bonnet F.Gene Ther. 2016 Jun;23(6):543-7. doi: 10.1038/gt.2016.28. Epub 2016 Apr 4.PMID: 27052801

**INTELLECTUAL PROPERTY**

Mammalian non-human bi-transgenic animal that produces humanized milk, milk, vectors, methods, National Institute of Industrial property (INPI): submitted 12th August 2012, act N: P2012 010 3002. PCT: PCT/EP2012/003400; Mutto Adrián, Mucci Nicolás, Kaiser Germán, Universidad Nacional de San Martín (UNSAM) - Instituto Nacional de Tecnología Agropecuaria (INTA).

**AWARDS AND DISTINCTIONS**

**Award INNOVAR 2011**, category: Applied Science, Argentine Ministry of Science, Technology and Productive Innovation,

"Cloning and transgenesis, formula milk production".

**Award La Nación Banco Galicia** **to the Agricultural Excellence**

Best research project, 2011

**Award La Nación Banco Galicia to the Gold Agricultural Excellence**:

Best work of the year 2011

**Award INNOVAR de ORO 2011**,

"Cloning and transgenesis, formula milk production".

**Award CITA 2011 to the Technological Innovation**

"Cloning and transgenesis, formula milk production".

Government of the province of Buenos Aires, Sociedad Rural Argentina,

Government of the province of Córdoba, Córdoba, Argentina

**“Distinction to the Biotechnology research”**

INTA, Argentine Ministry of Agriculture, Livestock and Fisheries.

**“Distinction and declared of public interest to the research project in milk of high nutritional value in transgenic cattle**",

Honorable Council of the city of Balcarce, Buenos Aires province, Argentina, November 2011.

**Approval presented by the Honorable Chamber of Deputies of Argentina, approved by the President of Argentina, Dr. Cristina Fernández de Kirchner, for the project** “**Production of the first bitransgenic cow in the world**”, presented on the 3918-D-2012 file of the mentioned Chamber, approved by the Jefatura de Gabinete de Ministros, Secretaría de Relaciones Parlamentarias, Subsecretaría de Relaciones Institucionales, Ministerio de Agricultura, Ganadería y Pesca de la Nación, y Secretaría de Agricultura, Ganadería y Pesca de la Nación.

**Award Bernardo Houssay, second prize**, awarded to the Best Biotechnology Development, Sociedad Argentina de Biología, 2012

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