

**SUPPLEMENTARY MATERIAL**

**corresponding to:**

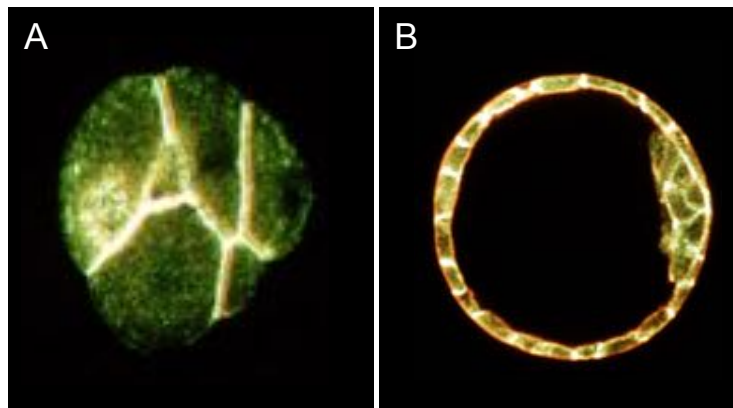
**Developmental Biology in Chile:  
historical perspectives and future challenges**

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**Supplementary Material** for *Developmental Biology in Chile: historical perspectives and future challenges*, by Miguel L. Concha and Iskra A. Signore.

The Supplementary Material includes:

1. *Supplementary Figure 1*: Luis Izquierdo and the first confocal microscope images in Chile
2. *Supplementary Figure 2*: UNESCO Developmental Biology Course 1993
3. *Supplementary Figure 3*: International courses, symposia, meetings and open lectures of developmental biology held in Chile.
4. *Supplementary Table 1*: Number of abstracts in developmental and reproductive biology presented at Chilean scientific societies (period 1975-1993)
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**Supplementary Figure 1. Luis Izquierdo and the first confocal microscopy images in Chile.** Confocal microscopy image showing 8-cell stage undergoing compaction (A) and blastocyst (B) mouse embryos stained for phalloidin and fodrin. Taken by Luis Izquierdo and Roxana Pey, 1992. Luis Izquierdo was pioneer in introducing the first confocal microscope in Chile.



**Supplementary Figure 2. UNESCO Developmental Biology Course 1993.** The course "Imaging the Cell during Development and Reproduction" was held at the marine biological station of the UCN, Campus Coquimbo (north Chile), on January 12-26 1993. Pictures show some members of the teaching staff and students. (A) Juan Fernández (left), Joseph Sanger (middle) and Gerald Schatten (right) at a formal activity of the course. (B) Bill Jefferey (left) having dinner with students from the course. (C) Juan Fernández (left) talking with Joseph Sanger (middle) and Jean Sanger (right). (D) Discussion at poster presentations; from left to right: Gerald Schatten, Karin Lohrmann, Joseph Sanger. (E) Doing sight-seeing in Coquimbo; Juan Fernández (left) and Mathias Hafner (right). (F) Daniel Mazia (left) and his wife Ruth Gilbert at a dinner of the course. (G) Enrique Dupré (left), Gerald Schatten (middle) and Gilda Bellolio (right) at a dinner of the course. (H) Some students of the course strolling in the streets of Coquimbo. Ricardo Moreno, student of Claudio Barros is the second from right to left. (I) Combining the course with relaxing times at the beach; an example with Claudio Barros. Other members of the of teachers not included in the photo are: (From Chile) Carlos Doggenweiler, Maria Imschenetzky, Nancy Olea and Roxana Pey. From abroad: Christian Petzelt, Elisabeth von Brand, Calvin Simerly, Sara Steffen and David Whittingham. The twenty selected students of the course were from Chile (Santiago, Valdivia, Concepción, Coquimbo), Argentina, Peru, Uruguay, Cuba, Brazil, Kenya and the US.



**Supplementary Figure 3. International courses, symposia, meetings and open lectures of developmental biology held in Chile.** Selection posters of courses, symposia, meetings and open lectures of developmental biology held in Chile. Full list in Table 1.

**Supplementary Table 1.** Number of abstracts in developmental and reproductive biology presented at Chilean scientific societies (period 1975-1993)

Year	Society Meeting / Section (#)	N° of posters + talks and (conferences)		
		Total	Developmental Biology (*)	Reproductive Biology
1975	18th Annual Meeting Biology Society	154 (18)	6 (2)	7 (2)
1983	26th Annual Meeting Biology Society	259 (22)	13 (0)	23 (1)
1984	27th Annual Meeting Biology Society	418 (84)	14 (1)	21 (0)
1985	28th Annual Meeting Biology Society	306 (34)	12 (2)	18 (0)
1985	5th Meeting Section Reproduction and Development from Biology Society	30 (0)	3 (0)	27 (0)
1986	29th Annual Meeting Biology Society	466 (72)	16 (0)	28 (2)
1987	30th Annual Meeting Biology Society	412 (56)	21 (5)	21 (1)
1987	1st Meeting of the Chilean Society for Cell Biology	30 (4)	7 (3)	4 (1)
1989	Joint Meeting: 32nd Annual Meeting Biology Society; 3rd Meeting Society for Cell Biology; 2nd Meeting Society of Reproduction and Development	490 (124)	23 (8)	32 (9)
1990	33rd Annual Meeting Biology Society	253 (36)	10 (0)	22 (1)
1990	3rd Meeting Society of Reproduction and Development	25 (3)	1 (1)	24 (2)
1991	Joint Meeting: 34th Annual Meeting of Biology Society; 5th Meeting Society for Cell Biology; 4th Meeting Society of Reproduction and Development	412 (38)	19 (3)	41 (2)
1993	7th Meeting Society for Cell Biology	77 (1)	5 (0)	0 (0)

(#) The information presented in this table was obtained from proceedings of annual society meetings that were available online for the period 1975-1993. For some years the information is missing, as proceedings in these cases were only available as hard copies and could not be accessed due to shut down of libraries in the context of SARS-CoV-2 pandemic.

(\*) For an abstract to be considered of developmental biology we used three main criteria: (i) to have a developmental biology question, with no explicit focus on physiology, clinics, endocrinology or applied technology; (ii) to include the study of temporal series, or the concept or framework of ontogeny; and (iii) to study embryonic or prenatal stages.

**Supplementary Table 2.** Investigators performing developmental biology research at Chilean universities (period 1975-1993)

City / University	Research Topic (Model)	Researchers (#)
<b>COQUIMBO</b>		
<u>Universidad Católica del Norte, Campus Coquimbo</u>		
<i>Faculty of Marine Sciences</i>		
Department of Marine Biology	Fertilisation and early development (scallop, shrimp, and other molluscs and bivalves)	<b>Bellolio G.; Lohrmann K.; Dupré E.</b>
<b>SANTIAGO</b>		
<u>Pontificia Universidad Católica of Chile</u>		
<i>Institute/Faculty of Biological Sciences (*)</i>		
Department of Physiological Sciences	Gamete interaction, Fertilisation, Acrosome reaction (hamster, guinea pig)	<b>Barros C.; Berrios M.; Bize I.; Cabello P.; Herrera E.; Jedlicki A.; Salgado A.; Vigil P.</b>
	Effect of high potassium on preimplantation development (mice)	<u>Ortiz M.E.</u> ; Pérez E. Kaltwasser G.; Riffo M.; Roblero L.
	Circadian rhythms in development (sheep)	<u>Serón-Ferré M.</u> ; <u>Llanos A.</u> ; Parraguez V.; Rayman R.; Riquelme R.; Vergara M.
Department of Cell Biology	Gastric development (chick)	<u>Koenig C.</u> ; <u>Dabiké M.</u> ; Belmar M.; Brandán E.; Munizaga A.; Nuñez R.
	Proteoglycans and matrix (Drosophila)	<u>Cambiazio V.</u> ; Brandán E. Inestrosa N.
<u>Universidad de Chile</u>		
<i>Faculty of Sciences</i>		
Department of Biology	Preimplantation mammalian development (rat, mouse)	<b>Izquierdo L.</b> ; Ahumada A.; Baiza L.; Basso C.; Becker M.I.; Doggenweiler C.; Faúndez V.; Fernández M.S.; González A.; Lois P.; Lopez M.T.; Mancilla A.; Matte C.; Mayor R.; Naves R.; Pey R.; Sepúlveda M.S.; Tellez V.
	Ovoplasmic segregation (leech)	<b>Fernández J.</b> ; González R.; Matte C.; Olea N.; Rivas C.; Téllez V.
<i>Faculty of Veterinary and Animal Sciences</i>		
Department of Biological Animal Sciences	Development of the bovine ruminal epithelium	<u>Arias J.L.</u> (\$) <u>Fernández M.S.</u> ; Cabrera R.; Miranda D.; Moreno A. Valencia A.; Vivanco E.

### *Faculty of Medicine*

Department of Experimental Morphology	Morphological approaches of several organs in various animals during development (e.g. lizard, chick, , quail, penguin, rodents, bovine, humans)	<b>Pereda J.; Lemus D.; Montenegro M.A.;</b> Brito R., Cardemil C.; Coloma L.; Estay F.; Fuenzalida, H.; Fuenzalida M.; Grunert G.; Illanes J.; Jeria M.; Lemus R.; Leyton V.A.; Pacheco A.; Palomino H.; Pereda M.T.; Rojas H.A.; Valencia J.M.
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## CONCEPCIÓN

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### Universidad de Concepción

#### *Faculty of Biological Sciences and Natural Resources*

Department of Molecular Biology	Gametes, fecundation, and early development (sea urchin)	<b>Imshenetzky M.;</b> Bustos A.; Carrasco U.; Enriquez S.; Gamboa S.; Gonzalez M.; Gutierrez S.; Inostroza O.; Jerez D.; Magaña A.; Massone R.; Merino V.; Montecinos M.; Nicolaidis D.; Oyarce A.M.; Ponce O.; Puchi M.; Roco, M. Sanchez, L.
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## VALDIVIA

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### Universidad Austral de Chile

#### *Faculty of Medicine*

Institute of Histology and Pathology	Development of the subcommissural organ and Reissner's fiber (lamprey, chick, duck, rat)	<u>Rodriguez E.M.;</u> Banse C.; Garrido O. Rodriguez P.; Rodriguez S.; Schoebitz K.; Speer L.
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#### *Faculty of Science*

Institute of Embryology	Morphogenesis and development of limbs, lens and digestive tract (chick, frog)	<b>Jorquera B.;</b> Garrido O.; Goicoechea O.; JaramilloJ.; Molinari E.; Pugin E.
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(#) The list of developmental biology researchers includes both principal investigators and collaborators, and were taken from abstracts presented at the Chilean Biology Society in the period 1975-1993. For their selection, we followed the same criteria used in Table 1. Researches that run a lab addressing central questions of developmental biology are labelled in bold. Researches that regularly presented abstracts at the Biology Society meetings using an ontogenic approach to understand better the structure and function of a particular organ or system, are underlined. The rest of investigators are mainly collaborators of the former two groups of researchers.

(\*) The Institute of Biological Sciences of the PUC, founded in 1970, then became the Faculty of Biological Sciences in 1982.

(\$) J.A. Arias and collaborators were previously at the Institute of Nutrition and Food Technology (INTA) from the Faculty of Sciences.

**Supplementary Table 3.** Research Centres funded by the Chilean government and private institutions in which developmental biology is one of the main areas of research

Years	Name	Funds (#)	Principal Investigators (*)
2009-2011	Millennium Nucleus of Neural Morphogenesis (NEMO)	MSI	<u>Miguel Concha</u> (director). Andrés Couve, Steffen Härtel, Claudio Hetz, <u>Manuel Kukuljan</u> , <u>Jimena Sierralta</u>
2009-2015	Millennium Nucleus on Regenerative Biology (MINREB)	MSI	<u>Juan Larrain</u> (director). Francisca Bronfman, Felipe Court, Luis Fuentealba, <u>Juan Pablo Henríquez</u> , María Paz Marzolo
2010-today	Center for Genome Regulation (CGR)	FONDAP	<u>Miguel Allende</u> (director). Mauricio Gonzalez, Rodrigo Gutierrez, Alejandro Maass, Martin Montecino, Ariel Orellana
2008-today	Center for Aging and Regeneration (CARE)	BASAL	Nibaldo Inestroza (director). Alejandra Alvarez, Marco Arreste, Enrique Brandan, Francisca Bronfman, Alfonso Gonzalez, <u>Juan Larrain</u> , Carlos Vio
2011-today	Millennium Biomedical Neuroscience Institute (BNI)	MSI	Andrés Couve (director 2011-2019), Claudio Hetz (director 2019-2020). <u>Miguel Concha</u> , Steffen Härtel, Cecilia Hidalgo, Pedro Maldonado, Jimena Sierralta
2011-today	Millennium Interdisciplinary Center of Neuroscience of Valparaiso (CINV)	MSI	Ramón Latorre (director). Francisco Bezanilla, Andrea Calixto, Ana M. Cárdenas, Andrés E. Chávez, <u>John Ewer</u> , Carlos González, Fernando González, Agustín Martínez, Pablo Moya, Alan Neely, Patricio Orio, Adrian Palacios, Tomás Pérez-Acle, Oliver Schmachtenberg, Juan Carlos Saez, <u>Kathleen Whitlock</u>
2015-today	Geroscience Center of Brain Health and Metabolism (GERO)	FONDAP	Christian González-Billault (director). Rodrigo Assar, Julio César Cárdenas, <u>Miguel Concha</u> , Felipe Court, Claudio Hetz, Agustín Ibañez, Patricia Lillo, Soledad Matus, Andrea Slachevsky, Daniela Thumala, René Vidal, Roque Villagra
2017-today	Center for Integrative Biology (CIB)	NG-P (%)	Felipe Court (director). <u>Gonzalo Cancino</u> , Julio César Cárdenas, <u>Joaquín Letelier</u> , Patricio Manque, Paola Murgas, Melissa Nassif, Diego Rojas, <u>Leonardo Valdivia</u> , Mario Sanhueza, Carol San Martín, René Vidal, Ute Woehlbier,

(#) Chilean Funding Programs: MSI (Millennium Science Initiative, since 1998); FONDAP (Fund for Research Centers in Priority Areas, since 1997); BASAL (Basal Funding Program for Scientific and Technological Centres of Excellence, since 2006). With the exception of MSI, which was first part of the Ministry of Planification and then the Ministry of Economy, the other programs formed part of the National Commission for Scientific and Technological Research (CONICYT) from the Ministry of Education. Since 2020, all these funding programs became centralised in the National Agency for Research and Development (ANID) from the newly formed Ministry of Science, Technology, Knowledge and Innovation.

(\*) The principal investigators that perform developmental biology research are underlined.

(%) Non-governmental private funds from the *Universidad Mayor*.