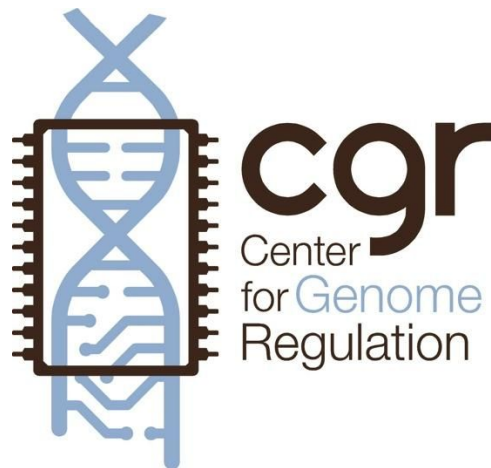


FONDAP CENTERS OF EXCELLENCE IN RESEARCH PROGRAM

ANNUAL PROGRESS REPORT

**Center for Genome Regulation
(CGR)**

2013



I.



PRESENTATION

PERIOD REPORTED: 1st Year 2nd Year 3rd Year 4th Year 5th Year

PERIOD COVERED: From: January 1, 2013 To: December 31, 2013

NAME OF THE CENTER		CODE
FONDAP Center for Genome Regulation (CGR)		15 09 00 07
DIRECTOR OF THE CENTER	E-MAIL	SIGNATURE
Miguel L Allende	allende@uchile.cl	
DEPUTY DIRECTOR	E-MAIL	SIGNATURE
Martín Montecino	mmontecino@unab.cl	
SPONSORING INSTITUTION		
Universidad de Chile		
ASSOCIATED INSTITUTION(S) (if applicable)		
Universidad Andrés Bello; Pontificia Universidad Católica de Chile		
CENTER WEBSITE ADDRESS		
www.genomacrg.cl		

DATE: 31/01/14



RESEARCH LINES

N ^o	Research Line	Objective	Principal Researcher	Associated Researcher(s)
1	Extreme Genomes: Plants	Comparative genomics of desert plants inhabiting an altitudinal gradient and of sporadic flowering plants of the extremely dry Atacama desert.	Rodrigo Gutiérrez Ariel Orellana	Andrea Miyasaka
	Extreme Genomes: Animals	Analysis of the genomic structure of the <i>Corydoras</i> fish species and transcriptomic profile of <i>Silurichthys</i> fish and of populations of <i>Flycatcher</i> frogs.	Miguel Allende Martín Montecino	Alvaro Glavic Christian Hödar
	Extreme Genomes: Microbes	Metagenomics of microbes associated with the soil of high altitude plants; Genomes of <i>Gibberellia</i> sp. and of biomining bacteria.	Mauricio González Alejandro Maass	Verónica Cambiazo
2	Relevant Genomes: <i>Chilodactylus</i>	The genome of the Mapuche, one of Chile's indigenous peoples	Rodrigo Gutiérrez Alejandro Maass Mauricio González Martín Montecino Ariel Orellana Miguel L Allende	Juan Francisco Miquel Giancarlo de Ferrari Silvana Zanlungo
	Relevant Genomes: <i>Vitis rotundifolia</i>	The genome of the table grape (sultanina variety)	Ariel Orellana Alejandro Maass	Andrea Miyasaka
	Relevant Genomes: <i>Salmo salar</i>	Structure and annotation of the genome of Atlantic salmon	Alejandro Maass Miguel Allende	Verónica Cambiazo



	Relevant Genomes: <i>DgJfMMHgU</i> <i>gJa cbJg</i>	The genome of this important fish pathogen	Alejandro Maass	Verónica Cambiazo
	Relevant Genomes: <i>Dfi bi gdyfjW</i>	Genomics, transcriptomics and proteomics of the peach	Ariel Orellana	Andrea Miyasaka
3	Gene Expression in Cells: Epigenetic mechanisms	Control of genes by chromatin modification and regulatory RNA molecules	Martín Montecino	Verónica Palma
	Gene Expression in Cells: Development, stem cells and regeneration	Molecular biology of differentiation, cell migration and tissue morphogenesis in development and regeneration	Miguel Allende	Verónica Palma Tomás Egaña Alvaro Glavic Giancarlo de Ferrari Christian Hödar
	Gene Expression in cells: The stress response.	Genomic and proteomic outcomes induced by a biotic or abiotic stressor	Ariel Orellana	Alvaro Glavic
	Gene Expression in Cells: Networks and modeling	Use of <i>caM</i> data to construct theoretical interaction networks	Alejandro Maass Mauricio González Martín Montecino	

II. ADMINISTRATIVE ASPECTS

- 1. Budget execution:** Describe and justify any budgetary modifications (itemized) of the original proposal.

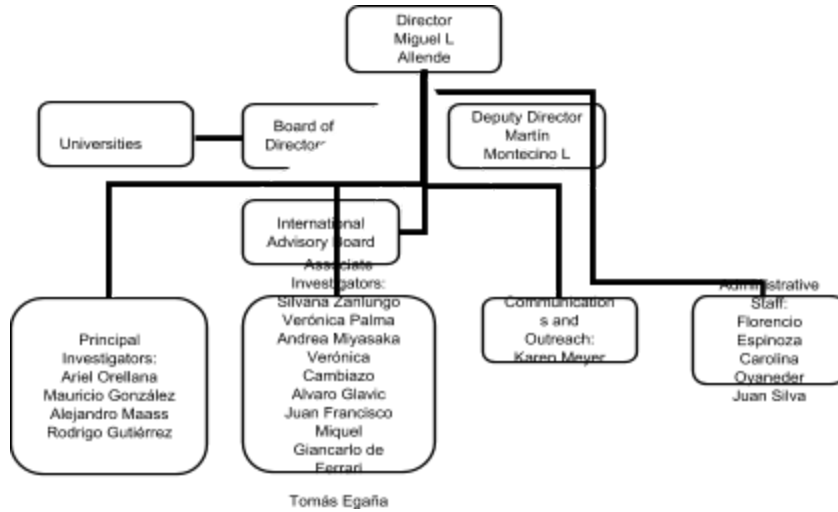
We have made only minor modifications to this years' budget.

- 2. Accomplishment of institutional commitments:** describe any difficulty (ies) encountered regarding this aspect.

All institutions involved in the project have complied with their obligations in terms of monetary and material support for the investigators. The few exceptions have been satisfactorily resolved.

3. Organizational Chart: Present an organizational chart of the Center depicting its main links to companies, associated institutions, and other units within the same institution.

A chart showing the internal organization of the CGR



A chart showing principal institutions interacting with the CGR





**Comisión Nacional de Investigación
Científica y Tecnológica - CONICYT**



4. Personnel

Table indicating position and hourly commitment of all CGR personnel (scientific and administrative) regardless of their funding source involved with the CGR during 2012. A commitment of 44 hours refers to the weekly commitment during the period in which they belonged to the Center.

Name	Position at CGR	Commitment (hours)
Miguel L Allende	Director	44
Martín Montecino	Deputy Director	30
Ariel Orellana	Principal Investigator	26
Alejandro Maass	Principal Investigator	26
Rodrigo Gutiérrez	Principal Investigator	26
Mauricio González	Principal Investigator	26
Silvana Zanlungo	Associate Investigator	15
Verónica Palma	Associate Investigator	15
Andrea Miyasaka	Associate Investigator	15
Verónica Cambiazo	Associate Investigator	15
Alvaro Glavic	Associate Investigator	15
Juan Francisco Miquel	Associate Investigator	15
Tomás Egaña	Associate Investigator	15
Christian Hödar	Associate Investigator	15
Nicolás Loira	Post doc	44
Vicente Acuña	Post doc	44
Phillippe Bordon	Post doc	44
Rodrigo Pulgar	Post doc	44
Dinka Mandakovic	Post doc	44
Leonardo Pavez	Post doc	44
Fernan Federici	Post doc	44
Rosario Villegas S	Post doc	44
María Laura Ceci	Post doc	44
Julian Verdonk	Post doc	44
Macarena Vargas	Post doc	44
Laura Gallardo	Post doc	44
Paula Vizoso	Post doc	44
Giorgia Daniela Ugarte	Post doc	44
Elena Vidal Olate	Post doc	44
Diana Grass	Post doc	44
Andrea Vega	Post doc	44
Adriana Batias	Post doc	44
Henriett Pál-Gábor	Post doc	44
Javier Canales	Post doc	44
Ann Reckhenrich	Post doc	44



Rodrigo Pulgar	Post doc	44
Leonardo Pavez	Post doc	44
Christian Hodar	Post doc	44
Alejandro Zuñiga	Post doc	44
Talia del Pozo	Post doc	44
Rodrigo Assar	Post doc	44
Gino Nardocci	Post doc	44
Felipe Veloso	Post doc	44
Dr. Luis Milla	Post doc	44
Catalina Prieto	Post doc	44
Jose Antonio O`Brien	Post doc	44
Luisa Pereiro	Post doc	44
Henriet Pal`Garbor	Post doc	44
Karina Castillo	PhD student	44
Andrés Aravena	PhD student	44
Alexander Frank	PhD student	44
Sebastián Donoso	PhD student	44
Adrián Moreno	PhD student	44
Marcelo Alarcon Lozano	PhD student	44
Miguel Avila Rivas	PhD student	44
Matias Medina Gonzalez	PhD student	44
Bernabe Bustos Becerra	PhD student	44
Eleodoro Riveras	PhD student	44
Pamela Naulin	PhD student	44
José Miguel Álvarez	PhD student	44
Tatiana Kraiser	PhD student	44
Viviana Araus	PhD student	44
Tomas Moyano	PhD student	44
Tomas Puelma	PhD student	44
Orlando Contreras	PhD student	44
Eva Villarroel	PhD student	44
Bernabé Bustos	PhD student	44
Calixto Domínguez	PhD student	44
Rodrigo Pulgar	PhD student	44
Calixto Domínguez	PhD student	44
Mauricio Latorre	PhD student	44
Graciela Argüello	PhD student	44
Leonardo Pavez	PhD student	44
Mariana Acuña	PhD student	44
Emilio Díaz	PhD student	44
Adriana Rojas	PhD student	44
Hugo Sepulveda	PhD student	44

Rodrigo Aguilar	PhD student	44
Fernando Bustos	PhD student	44
Claudia d'Alençon	PhD student	44
Cristian Undurraga	PhD student	44
Mario Sánchez	PhD student	44
Jorge Zúñiga	PhD student	44
Margarita Parada	PhD student	44
Joao Botelho,	PhD student	44
Gabriela Zavala	PhD student	44
Rodrigo Morales	PHD Student	44
Luis Solano	PhD student	44
Diego Rojas Benitez	PhD student	44
Consuelo Ibar	PhD student	44
Guillermo Rodríguez	Master's student	44
Daniela Elizondo	Master's student	44
Juan Pablo Parra	Master's student	44
Macarena Greve	Master's student	44
Omar Sandoval	Master's student	44
Flavia Roman Brigando	Master's student	44
Pablo Leon Medina	Master's student	44
Leandro Farias	Master's student	44
Francisco Altimiras	Master's student	44
Ricardo Gutiérrez	Master's student	44
Tatiana Opazo	Master's student	44
Daniel Meza	Master's student	44
Paulina Rudolffi	Master's student	44
María Ignacia Cadiz	Master's student	44
Kazherine Salazar	Master's student	44
José Moya	Master's student	44
Camila Mardones	Master's student	44
Oscar Peña	Master's student	44
Nicole Reynaert	Master's student	44
Consuelo Anguita	Master's student	44
Marjorie Alvarez	Master's student	44
Natalia Beiza	Master's student	44
Claudio Soto	Master's student	44
Paulina Falcón	Master's student	44
Pablo Lois	Master's student	44
Carolina Ortíz	Master's student	44
Samuel Martínez	Master's student	44
Angel Pardo	Undergraduate student	44
Alexis Peralta Carrera	Undergraduate student	44



Bernardo Pollak	Undergraduate student	44
Esteban Garate	Undergraduate student	44
José Galdames	Undergraduate student	44
Salomé Muñoz	Undergraduate student	44
Cristina Muñoz	Undergraduate student	44
Simón Carrillo	Undergraduate student	44
Daniela Ureta	Undergraduate student	44
Florencio Espinoza M	Administrator, accounting	20
Karen Meyer B	Journalist, communications	44
Carolina Oyaneder	Secretary	44
Juan Silva	Janitor and messaging	10

5. Changes in research personnel: Describe any changes in the principal and associate researchers relative to the original project.

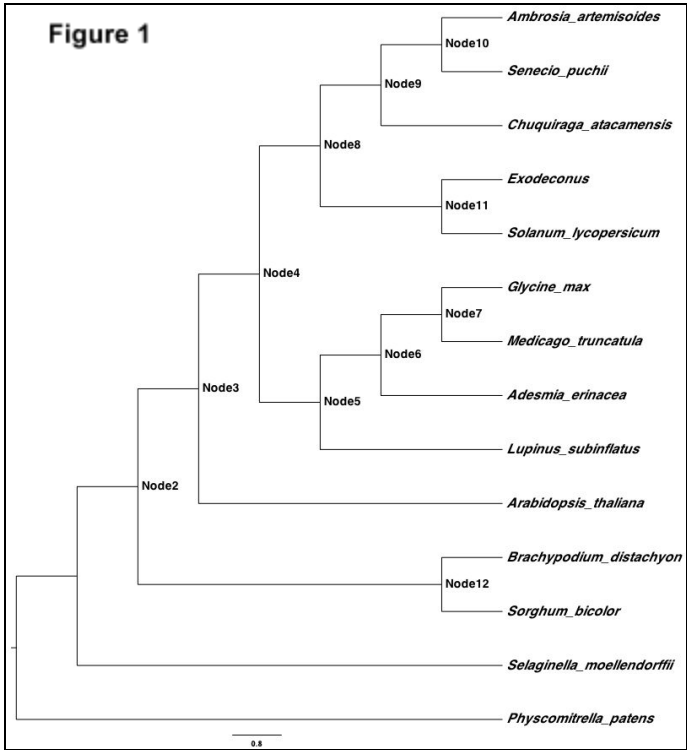
Our group of investigators remains unchanged except for the incorporation of Dr. Christian Hödar as a new Associate investigator (this was announced in last year's report). He became a full member of the center beginning in October 2013 when he concluded his postdoctoral fellowship and was hired by the Universidad de Chile.

6. Advisory committee: describe its tasks, the frequency of meetings, and usefulness of the advice provided to the Center. Also, report on the availability of the committee to assist the Center.

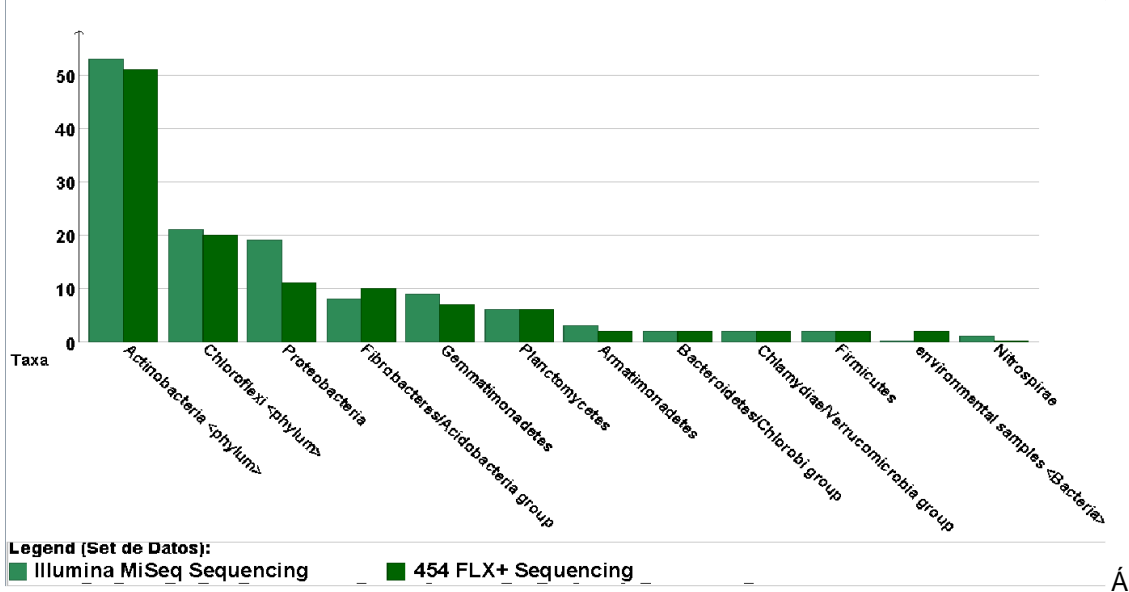
Our International Advisory Committee did not meet with us during 2013 (they did so in December of 2012) and we have scheduled a new meeting for April 2014. They will carry out an evaluation of our performance and offer suggestions as they did previously. The results of this internal evaluation will be crucial for meeting the challenges of the final stage of the first period of funding.

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VEJ|hgj|b|ZyFfH ca dgcb'gYYX Ygg'c fGi 'HUb|bU| Ybca Y"

Diagram illustrating the transition of H3 histone marks from immature neurons (E18) to mature neurons (Ad). The H3 protein sequence is shown as H3 N-ARTKQTARKSTGGKAPRKQLK...K. In immature neurons (E18), marks include NO66, Suz12, Ezh2, UTX, JMJ3, and H3K9me3. In mature neurons (Ad), marks include Wdr5, JMJD2a, HDAC2, JMJD3, UTX, GCN5, Ezh1, and H3K9me3. The diagram shows a shift from H3K9me3 to H3K4me3 and H3K27me3, and the presence of H3K9ac and H3K27ac. Pol II is shown transcribing the DNA in both states.

Neuronas inmaduras (E18)

Neuronas maduras (Ad)

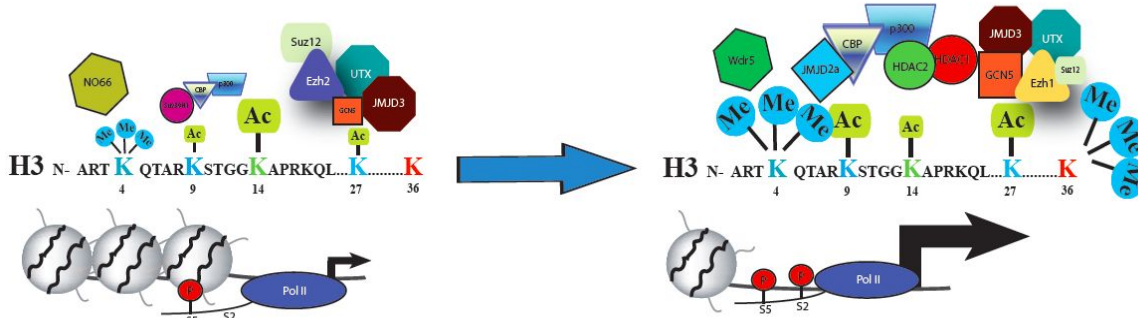


Diagram illustrating the transition of H3 histone marks from immature neurons (E18) to mature neurons (Ad). The H3 protein sequence is shown as H3 N-ARTKQTARKSTGGKAPRKQLK...K. In immature neurons (E18), marks include NO66, Suz12, Ezh2, UTX, JMJ3, and H3K9me3. In mature neurons (Ad), marks include Wdr5, JMJD2a, HDAC2, JMJD3, UTX, GCN5, Ezh1, and H3K9me3. The diagram shows a shift from H3K9me3 to H3K4me3 and H3K27me3, and the presence of H3K9ac and H3K27ac. Pol II is shown transcribing the DNA in both states.

2. RESULTS ACHIEVED PER RESEARCH LINE

Briefly describe the main results per research line achieved during the period.

Since we have described the results obtained thus far in each of the Research Lines above, in this section we will simply summarize the main publications related to each of the Lines. We also follow up with a current total of productivity metrics for the project in order to follow the progress of the Center towards becoming highly relevant in the field.

The main advances per Research Line are:

Line 1. Multiple altiplano plant transcriptomes obtained (article to be submitted at the end of 2014); transcriptome of *Rhinella* amphibians in diverse ecological contexts complete and article submitted early 2014; genome of first *Orestias* fish complete, five more species in progress for an article to be submitted in 2015; Transcriptome of annual flowering desert plants complete; Transcriptome of annual fish at diverse embryological stages complete and under analysis; metagenomics of desert microorganisms under way.

Line 2. Article describing the Mapuche/Huilliche genome has been submitted; we include this article as Appendix A. Other genomes of relevance that were completed are: the *G. Hubbu* table grape genome published (two articles), the Atlantic salmon (annotation of the genome in progress; article expected at the end of 2014) and the pathogen *D. g. M. H. g. U.* where we have completed sequencing and comparative analysis.

Line 3. Most of the experimental work, and thus the publications generated by the CGR, fall within this line as it encompasses the more traditional areas of research we follow. The most relevant publications were generated in the areas of stem cell research, cancer biology, regeneration, tissue engineering, network modelling, mathematical theory and basic cellular and molecular biology.

Indicator	2011 (yr1)	2012 (yr 2)	2013 (yr 3)	Accumulated or average
Number of ISI papers	34	35	37	106
Total Impact Factor of ISI papers	177.9	161.4	184.1	523.4
Average Impact factor of ISI papers	5.2	4.7	5.0	4.96
5 year citations (papers); average per paper*	1608 (153)	1716 (153)	1657 (129)	10.54
Co-authored publications[#]	3	4	8	15
Postdocs associated to CGR^{&}	24	26	32	27
PhD students associated to CGR^{&}	43	42	45	43
Total number of theses directed^{&}	84	82	93	86
Co-directed theses^{&} (CGR PIs)	5	4	7	5
Congress presentations	140	118	155	413
Conferences and courses organized	9	9	12	30

*Citations for articles published by the 6 Principal Investigators with a window encompassing the five previous years

#Papers in which more than one CGR investigator (Principal or Associate) are authors.

& As many students are the same from year to year, the numbers appearing in the "Accumulated" column are averages rather than sums

V. PRODUCTS GENERATED BY THE PROJECT

In what follows, complete the attached Excel spreadsheets taking into account the following:

REPORT ONLY PUBLISHED MATERIAL INCLUDING THOSE WITH AN OFFICIAL DOI POINTER (e.g., with EARLY ONLINE ACCESS).

EXCEPT FOR BOOKS, ALL BACKUP DOCUMENTS MUST BE PRESENTED IN DIGITAL FORMAT. DO NOT SEND PRINTED COPIES.

ONLY PUBLICATIONS THAT ACKNOWLEDGE THE FONDAP PROGRAM WILL BE CONSIDERED.

1. ISI Publications

For each publication, if applicable, the principal author and the corresponding author must be indicated using the following terminology:

¹ For principal author (example: Toro¹, J.)

² For the corresponding author (example: Toro², J.)

³ For principal and corresponding author (example: Toro³, J.)

Include a digital copy of each **PUBLISHED** paper.

2. Non ISI Publications

For each publication, if applicable, the principal author and the corresponding author must be indicated using the following terminology:

¹ For principal author (example: Toro¹, J.)

² For the corresponding author (example: Toro², J.)

³ For principal and corresponding author (example: Toro³, J.)

Include a digital copy of each **PUBLISHED** paper.

3. Books and book chapters

Include a hard copy of every **PUBLISHED** book.

Include a digital copy of the front page of the chapter in the case of a book chapter.

4. Patents

Include all patents generated by the FONDAP Center.

5. Congress presentations



Include abstracts of all presentations. Attach a digital copy of the front page of the congress/workshop book.

6. Organization of Scientific Meetings

List all congresses, courses, conferences, symposia, or workshops organized by the FONDAP Center.

Include abstracts of all presentations. Attach a digital copy of the front page of the congress/workshop book.

7. Collaborative Activities

List the scientific visits of Center members to international institutions

List the scientific visits of foreign researchers to the Center in Chile.

8. Postdoctoral Fellows

List postdoctoral fellows working in the Center during the reported period regardless of their funding sources.

Provide current affiliation and positions held by former postdoctoral fellows that left the Center during the reported period

9. Students

List titles of theses framed in the project completed during the reported period. Attach an abstract and the subject index.

List titles of theses in progress, framed in the project, during the reported period. Include digital copies of the corresponding thesis registrations.

Provide current affiliation and positions held by former students that graduated during the reported period

10. Funding Sources

List all funding sources including FONDAP.

VI. OTHER ACCOMPLISHMENTS

Report articles or notes published in the media (provide URL links, if available), awards, prizes, etc.

We would like to inform that during 2013 several very important pieces of equipment were added to the existing infrastructure at the CGR. For instance, two new sequencers were purchased (Illumina MySeq and Illumina Hi SCAN). With funds from the University of Chile, a new animal facility was built at the Faculty of Science; this will be officially inaugurated in 2014. Finally, a new advanced microscope was obtained through adonation of the University of Heidelberg to Dr. Allende: it is a Digital Light Sheet Microscope (DSLMS) that allows three dimensional reconstruction of organs or embryos (see the newspaper article in the Outreach section, Appendix B).

VII. SUGGESTIONS

What recommendations would you make to the FONDAP Program Office to improve the performance of the Center and the review process? Please describe.

B. In the following pages, we include a description of the activities carried out in the area of outreach and dissemination of the Center's activities. This area is the responsibility of the CGR's journalist, Ms. Karen Meyer.