

Highlights of the 1st Argentine Symposium of Young Bioinformatics Researchers (1SAJIB) organized by the ISCB RSG-Argentina

R. Gonzalo Parra^{1,2}, Lucas A. Defelipe³, A. Brenda Guzovsky¹, Alexander Miguel Monzon⁴, Fiorella Cravero⁵, Estefanía Mancini⁶, Nicolás Moreyra⁷, Carla Luciana Padilla Franzotti⁸, María Victoria Revuelta⁹, María I. Freiburger^{1,10}, Nahuel N. Gonzalez¹⁰, German A. Gonzalez¹¹, Facundo Orts¹², Nicolas Stocchi¹², Marcia A. Hasenahuer⁴, Elin Teppa⁶, Diego J. Zea⁶, Nicolas Palopoli^{*4,6}.

1 Protein Physiology Laboratory, Departamento de Química Biológica, Facultad de Ciencias Exactas y Naturales, UBA-CONICET-IQUIBICEN, Buenos Aires, Argentina.

2 Quantitative and Computational Biology Group, Max Planck Institute for Biophysical Chemistry, Goettingen, Germany.

3 Structural Bioinformatics Group, Departamento de Química Biológica, Facultad de Ciencias Exactas y Naturales, UBA-CONICET-IQUIBICEN, Buenos Aires, Argentina.

4 Unidad de Físico Química, Departamento de Ciencia y Tecnología, Universidad Nacional de Quilmes, CONICET, Bernal, Buenos Aires, Argentina.

5 Process Engineering - Chemoinformatics Group, PLAPIQUI (UNS-CONICET), Bahía Blanca, Argentina.

6 Fundación Instituto Leloir-IIBBA-CONICET, Buenos Aires, Argentina.

7 Instituto de Ecología, Genética y Evolución de Buenos Aires (IEGEB-CONICET), Buenos Aires, Argentina.

8 Facultad de Bioquímica, Química y Farmacia, Universidad Nacional de Tucumán, San Miguel de Tucumán, Argentina.

9 Division of Hematology and Medical Oncology, Department of Medicine, Weill Cornell Medical College, Cornell University, New York, NY 10065, USA.

10 Facultad de Ingeniería, Universidad Nacional de Entre Ríos, Oro Verde, Entre Ríos, Argentina.

11 Instituto de Diversidad y Ecología Animal, UNC-CONICET, Córdoba, Argentina.

12 Instituto de Investigaciones Biológicas-CONICET, Universidad Nacional de Mar del Plata, Mar del Plata, Argentina.

Corresponding author:

Nicolas Palopoli

Email address: npalopoli@unq.edu.ar

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2 **(1SAJIB) organized by the ISCB RSG-Argentina**

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8 **Author affiliations**

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10 Ciencias Exactas y Naturales, UBA-CONICET-IQUIBICEN, Buenos Aires, Argentina.

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27 12 Instituto de Investigaciones Biológicas-CONICET, Universidad Nacional de Mar del
28 Plata, Mar del Plata, Argentina.

29 **Abstract**

30 The 1st Argentine Symposium of Young Bioinformatics Researchers took place on 9-10
31 May 2016 at Universidad de Buenos Aires, Buenos Aires, Argentina. This event evolved
32 from a previous meeting series known as Argentine Student Council Symposium that
33 have been successfully organized since 2012 by the Regional Student Group of
34 Argentina (RSG-Argentina). The change in name reflects the new vision of the
35 organizing committee to gather together all students at Bachelor, Master and PhD
36 levels, postdocs and researchers that are still not Principal Investigator. Here we
37 summarize the main activities and outcomes from this year's meeting and offer some
38 insights into our future plans.

39 * **Corresponding author**

40 Nicolas Palopoli (npalopoli@unq.edu.ar)

41 **Introduction**

42 The Regional Student Group of Argentina (RSG-Argentina) was officially recognized as
43 the local branch of the International Society for Computational Biology Student Council
44 (ISCB-SC) in 2012. Ever since, it has steadily grown as a nonprofit, nationwide network
45 of undergraduate students, PhD candidates and postdoctoral researchers working or
46 interested in bioinformatics and computational biology. It aims to break the limits
47 imposed by geography and science fields to provide a space of interaction among
48 students and professionals, encourage the exchange of ideas and knowledge to
49 develop opportunities for research and education, and assist in the growth of the
50 bioinformatics community in the country and Latin America. Led by proactive students
51 and with constant support from ISCB-SC and the Argentine Association of
52 Bioinformatics and Computational Biology (A2B2C), the RSG-Argentina has been
53 offering opportunities for learning new skills, sharing research outcomes and
54 professional development in general for the last five years.

55 **Highlights from 1st Argentine Symposium of Young Bioinformatics Researchers**

56 The 1st Argentine Symposium of Young Bioinformatics Researchers (1st SAJIB) was
57 held on 9-10 May 2016 at Universidad de Buenos Aires, Buenos Aires, Argentina. The
58 symposium followed the format from previously organized events by RSG-Argentina,
59 consisting of a first day of talks and poster presentations and a second day of practical
60 workshops. We had 3 keynote speakers and 6 short talks given by students in the first
61 day, and 2 workshops in the second one.

62 ***Scope and format of the symposium***

63 The local computational biology and bioinformatics community has continuously grown
64 over the last decade, especially since the Argentine Association of Bioinformatics and
65 Computational Biology (A2B2C) was created in 2009. In total 6 annual Argentine
66 conferences have been organized by the A2B2C in different cities across the country.
67 Since its creation in 2012, RSG-Argentina has been supporting these conferences by
68 gathering together the students community, engaging universities and organizing
69 specific complementary workshops as satellite events at the venues. However, there
70 are two main problems that constitute a barrier for young students to integrate into this
71 community. As the Argentine annual conference on bioinformatics is held on different
72 geographical places across the country, this makes it difficult for many people, specially
73 students, to attend, both for economic and time reasons. Also, since internationally
74 recognized keynotes are invited to the conference, the official language is English and
75 this constitutes an idiomatic barrier for some undergraduate or PhD students in the early

76 years seeking to participate actively and get the most of the event by interacting with
77 senior scientists or presenting their work.

78 SAJIB aims to complement the annual Argentine conference by solving the
79 aforementioned problems. The Symposium is planned to be organized annually in
80 Buenos Aires with Spanish as its official language. Since Buenos Aires is centrally
81 located and well-connected it is easy and cheap to reach from most places in the
82 country. Following the structure of the symposia organized by the ISCB Student Council
83 (Francescatto et al., 2015; Parra et al., 2015; Wilkins et al., 2016) and other RSGs
84 (White et al., 2016), this event is held on a more relaxed atmosphere than the main
85 conference, encouraging students to feel more comfortable presenting their work and
86 interacting with each other.

87 Securing funding for this year's symposium allowed us to recognize the work and effort
88 of some participants. Andrés Rabinovich, PhD student from Fundación Instituto Leloir
89 and CONICET fellow, was selected by the organizers to receive the Best Presentation
90 award. All invited Keynote speakers and Workshop lecturers received a desktop gift.
91 Plus, coffee-break refreshments and RSG-Argentina pins were given for free to all
92 participants.

93 **Keynote presentations**

94 We had three keynote speakers representing different areas of research who delivered
95 interesting talks on their current projects related with Bioinformatics:

- 96 1. Dr. Adrian Turjanski leads the Structural Bioinformatics Group at UBA-CONICET-
97 IQUIBICEN. He works on the application of computational biology techniques to
98 find potential drug targets in pathogen genomes, with a particular interest in
99 fighting *Mycobacterium tuberculosis*.
- 100 2. Dr. Ernesto Roman is a biochemist and computational biophysicist whose main
101 interest is on the sequence-structure-dynamic-function relationships in proteins.
102 He studies mutations on the human frataxin protein responsible for the
103 Friedreich's ataxia syndrome.
- 104 3. Dr. Pablo Turjanski is a computer scientist developing computational methods
105 and algorithms to analyze biological data under a framework of Big Data science.
106 He currently works on parameter-free and alignment-free methods for studying
107 protein repeats.

108 **Short talks**

109 The symposium offered 6 short talks by current undergraduate and PhD students, along
110 with 25 posters presented by undergraduate students, PhD candidates and postdoctoral
111 researchers.

112 Jorgelina Moreiras Clemente, from Universidad Nacional de la Plata (UNLP), gave the
113 first talk, where she presented her work on metagenomic analysis of soils from extreme

114 environments, focusing on the search for microorganisms with potential use for soil
115 bioremediation.

116 Ariel Aptekmann, from Universidad de Buenos Aires (UBA), gave an insight into the
117 relation between optimal growth temperature and information content in the core
118 promoter region of archeal genomes.

119 Andrés Rabinovich, from Fundación Instituto Leloir (FIL), presented an heuristic method
120 to find group of genes that are similarly expressed with high biological congruence,
121 using both gene expression profiles and gene ontology information.

122 Julia Marchetti, from Universidad Nacional de Quilmes (UNQ), discussed the possible
123 random origin of proteins through the analysis of enzymes with reduced numbers of
124 amino acids in their composition, highlighting their capability to fold and sustain their
125 biological functions.

126 Victoria Dumas, from UBA, presented a study on the bacterial p450s family. It integrates
127 information obtained from both the genetic and structural context of those proteins in
128 order to develop a method to predict the reaction catalyzed by each enzyme.

129 Finally, Osvaldo Burastero, from UBA, shared his work on the Histidine Kinase CpxA
130 autophosphorylation mechanism, for which he used a hybrid QM/MM approach.

131 **Workshops**

132 Dr. Elin Teppa (FIL) and BSc/MSc Marcia Hasenahuer (UNQ) gave a 10-hour course
133 called 'Visualization, Analysis and Molecular Modelling'. This workshop aimed to
134 introduce basic and advanced tools to represent, manipulate and model biomolecular
135 structures, using methods considered nowadays as standard tools. The course made
136 special focus on guided demonstration and hands-on activities to develop analysis
137 skills.

138 Dr. Diego Javier Zea (FIL) delivered the 8-hour course 'A day with (the) Julia
139 (language)'. This course introduces the basics of Julia, a high level programming
140 language designed for scientific computing with a close to C performance. The
141 workshop covers from the basic scripting tools needed in bioinformatics pipelines to the
142 available tools for data analysis.

143 **Feedback**

144 The 1st SAJIB was generally well-received. The presented posters and talks covered a
145 wide range of topics and most participants agreed that the scope of the meeting suited
146 their particular interests. As a networking opportunity, SAJIB favoured discussions and
147 ideas were proposed for collaborations among students from different parts of the
148 country. As seen in previous events, many students attending for the first time were
149 generally interested in participating more actively in the organisation and planning
150 activities of RSG-Argentina. This provides an excellent opportunity for increasing the
151 diversity of the organizing committee. Participants proposed the organization of similar

152 meetings in other cities in the country next year. It is difficult for a relatively small and
153 self-organized group to reach sponsors, so our funding capability for travel costs and
154 remote assistance is limited. However, as we are continuously growing our list of
155 members and consolidating our presence in courses and meetings nationwide, this
156 should become a priority. Overall, the feedback that we received was remarkably
157 positive and encouraged us to continue organising events of this magnitude.

158 **Conclusions and future directions**

159 Almost a decade after the first article on the emerging landscape of computational
160 biology in Argentina (Bassi, González and Parisi, 2007), we have already reached many
161 milestones as a scientific community. The Argentine Association of Bioinformatics and
162 Computational Biology was created and with it, the Argentine conference in these fields
163 has been held annually for the last 7 years. The student community got organized and
164 created the Argentine branch of the ISCB Regional Student Groups. Bioinformatics and
165 computational biology have steadily grown in the last years and this is evident in the
166 amount of research teams spread all over the country that are working purely on these
167 disciplines or using them as accessory tools for the wet lab. This growth is also seen in
168 the amount of publications in top tier journals in these fields and the emergence of
169 specific undergraduate and Masters programs. This offers an unprecedented number of
170 opportunities for young students looking for a place in academia and a career in
171 bioinformatics research.

172 As is commonplace for most scientific disciplines in developing countries like Argentina,
173 there are many economic, social and geographic challenges preventing the reach of the
174 full potential that the Argentine bioinformatics and computational communities have to
175 offer. To overcome those difficulties, interaction among the students, senior
176 researchers, A2B2C, the universities, the Ministry of Science and Technology and the
177 National Scientific and Technical Research Council of Argentina has been and still is
178 fundamental for the continuous development that we have experienced as a scientific
179 community. The RSG-Argentina has the extremely important responsibility of bridging
180 between the needs of students for improving their skills and future potential, and the
181 academic and research strategies that are instrumented by senior investigators and
182 organizations. Our organization promotes the nurturing of the youngest players in
183 bioinformatics and computational biology, their involvement in specialized and high-
184 quality meetings and the acquisition of soft skills and leadership capabilities to become
185 active players in Argentina and internationally.

186 Social interaction and science communication among peers is the rosetta stone upon
187 which we can build a competitive and solid community that will endure in time. In 10
188 years we moved from knowing about a disperse number of groups scattered along the
189 country, with almost no connection among them, to have a solid scientific organization
190 at different levels. The 1st SAJIB brought together more than 40 students from all over

191 the country and from all academic levels, from undergraduates to postdocs and early
192 career researchers. The organization of this event by the students collective, gathered
193 together in the RSG-Argentina and with the strong support of the senior researchers, is
194 proof that we are walking in the right direction and confirmation that many good things
195 are still to come if we continue towards this path.

196 For more information regarding our activities please check our website
197 <http://www.rsgargentina.com.ar>. We are also active on Twitter ([@RSGArgentina](#)) and
198 Facebook ([RSG - Argentina](#)).

199 **Author contributions**

200 R. Gonzalo Parra and Nicolas Palopoli drafted the manuscript. All authors completed
201 and reviewed the manuscript. All authors contributed to the organization of the
202 symposium.

203 **Grant information**

204 Universidad de Buenos Aires and the International Society for Computational Biology
205 Student Council (ISCB-SC) sponsored the event. Universidad de Buenos Aires provided
206 the venue for the meeting and computational support for the workshops. ISCB-SC
207 sponsored awards and event expenditures. The funders had no role in study design,
208 data collection and analysis, decision to publish, or preparation of the manuscript.

209 **Acknowledgements**

210 We are very grateful to all RSG-Argentina members who helped with students
211 arrangements, revision of abstracts and other organizational tasks related with SAJIB.
212 We would like to thank our PhD advisors and group leaders for their patience and
213 support in allowing us to take part in this event and other RSG-Argentina activities. In
214 particular, we are very thankful to Prof. Marcelo Marti and Prof. Adrián Turjanski who
215 helped us with arranging the symposium facilities at Universidad de Buenos Aires.

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