



UPF research monograph

Results of the 7th EU Framework
Research Programme

A RESEARCH-INTENSIVE UNIVERSITY

UPF's results in the European Commission's 7th Framework Programme validate the institution's strategy of promoting research



Despite representing just 1% of the Spanish university system's teaching staff, UPF obtained 10% of all the funding with which the European Commission (EC) provided Spain's universities through its 7th Framework Programme (FP7). That statistic reflects "our research staff's high productivity levels compared to the average", according to Francesc Posas, vice-rector for Science Policy.

As the EC's main instrument for financing European research and development in the 2007-2013 period, FP7 "has been vitally important to UPF, because it has marked the beginning of our transition to a genuine research university, with results that have catapulted us into Europe's top division", states Àngel Lozano, vice-rector for Research.

In comparison to FP6, the EC's previous framework programme, UPF enjoyed a greater increase in funds for research activities than any other European university. The overall sum it obtained multiplied sixfold to stand at over €75



million, while the success rate of its applications for funding rose from 15% to 21%, with a total of 145 projects receiving financing.

FP7's structure

"FP7 had a budget of more than €50 billion and was divided into 4 specific programmes, Cooperation, People, Ideas-ERC and Capacities", explains Eva Martín, the head of UPF's Research Service.

The Cooperation programme, the core of FP7, fostered collaborative research across Europe and with other partner countries in a number of thematic areas, including information and communication technologies (ICTs), and socioeconomic sciences and the humanities. UPF is participating in 65 Cooperation projects and is coordinating 18 of them (15 in the ICTs area and 3 in that of health).



1. Tomàs Marquès-Bonet, PRIMATESV project.

2. Laia Pujol, LEAP project, (XIM, SPECS-UPF).

3. Xavier Serra, CompMusic project. Frederic Camallonga

4. From left to right: Melanie Torres, Arash Bahrehmand, Alun Evans and Josep Blat, IMPART project.

5. Eva Martín, head of UPF's Research Service.

Attracting talent: a priority

UPFellows is a project that the University has established to help attract talent and foster mobility in circumstances marked by fierce competition and cuts in resources. It boasts a budget of over €5 million, having received more than €2 million from FP7's People programme plus further

funding from a pair of complementary sources, the 'La Caixa' Foundation and the MINECO's National R&D&I Plan. It offers career opportunities for postdoctoral researchers of any nationality who have internationally proven levels of excellence and the potential to become world leaders in their respective fields.

That applies, for example, to Mikhailis Markakis, who holds a PhD from the Massachusetts Institute of Technology and has recently joined UPF's Department of Economics and Business. "The programme is really

appealing as it offers very good conditions for carrying out quality research", he says.

Launched in May 2013, UPFellows offers 24 grants through 3-year contracts (renewable subject to satisfactory performance in assessments), funding for each researcher's work, and complementary support services

The aim of the People programme was to provide researchers within and beyond the European Union with support for mobility and career development. It was implemented via a set of Marie Curie actions designed to help researchers reinforce their skills and competences throughout their careers.

The Ideas-ERC (European Research Council) programme "fit UPF like a glove in terms of the type of researchers we have and aim to attract, people who are renowned in their fields, highly international, and very capable of working independently and managing ambitious projects", says Lozano. The number of grants obtained in this category has actually become a benchmark for gauging the quality of the institution's research and its impact worldwide. In that regard, UPF is Spain's highest-ranking university and competes with the leading institutions at the European level. It obtained a total of 19 grants for 'frontier research', FP7's main new aspect.

Lastly, the Capacities programme sought to help strengthen and make the most of the research capabilities Europe requires to become a thriving knowledge-based economy. It encom-



passed areas such as research infrastructures, research for the benefit of SMEs, and science in society. UPF secured 15 grants in this category.

Focus on Europe

Posas is convinced that internationalization is the key to maintaining quality standards in research. It "not only greatly facilitates success when applying for funding in cases requiring consortia and networks; first and foremost, it facilitates success in general, as it means we're open to the world rather than restricting ourselves to our own talent pool", he declares.

Comparative data on the funds UPF has received also suggests that internationalization is the way forward. The Spanish administration, through the National Scientific and Technical Research Plan of the Ministry of the Economy and Competitiveness (MINECO), was the University's main source of income for research in 2009. In 2013, however, it was UPF's least significant source of such income. In contrast, funding from the European administration has more than doubled over the last five years to become

the University's leading source of research money.

With the data in question in mind, "we're focusing on Europe, particularly where large, ambitious projects are concerned", comments Lozano. "Funding from the Spanish and Catalan authorities has either been frozen or substantially reduced", he explains.

Efficient management

None of all this would be possible without the good management that UPF's Research Service is tasked with providing. "We offer researchers advice on and help with identifying the most appropriate sources of funding for their type of project, as well as support for writing up applications", states Martín. "During the FP7 funding period, we introduced research promoters on each campus, specialists who are familiar with each area's researchers", adds Lozano. "They monitor calls for applications, encourage our research groups to respond to such calls, and help them to do so."

The Research Service also carries out activities for making researchers aware of the importance of actively seeking funding. "We work with different stakeholders, including the EC, the Agency for the Management of University and Research Grants, the Catalan business support agency ACCIÓ and the Spanish Foundation for Science and Technology to organize information days for letting researchers know about funding opportunities and reflecting on various initiatives", says Martín. Such events have notably included ERCday in 2012 and a day on the Horizon 2020 research programme's social sciences and humanities area in January this year.

Additionally, the Research Service monitors each project's progress. "We make sure deadlines are met and the necessary administrative procedures undertaken to ensure that negotiations are successful and projects can begin", explains Martín. "We also provide management support for researchers for the entire duration of their project, keep track of finances and prepare documentation to justify expenditure."

UPF'S RESULTS IN FP6 AND FP7

	PROPOSALS SUBMITTED	PROJECTS FINANCED	SUCCESS RATE	FUNDING OBTAINED
FP6	270	41	15.19%	€ 10.845.400
FP7	676	145	21.44%	€ 75.259.741

PROJECTS BY FP7 SPECIFIC PROGRAMME

SPECIFIC PROGRAMME	NUMBER OF PROJECTS	FUNDING OBTAINED
Capacities	15	€ 3.584.648
Cooperation	65	€ 26.735.247
Ideas-ERC	19	€ 34.120.035
People	46	€ 10.819.811

PROJECTS BY UPF AREA

AREA	NUMBER	FUNDING
Health and life sciences	27	€ 13.553.440
Social and human sciences	39	€ 15.707.284
Communication and IT	78	€ 43.805.841
Institutional (COFUND)	1	€ 2.193.175
Total	145	€ 75.259.741

TOTAL FUNDS OBTAINED BY SOURCE (IN MILLIONS)

TYPE OF BODY	2009	2010	2011	2012	2013
Catalan administration	9.790	9.984	8.248	6.785	6.345
Spanish administration	16.899	12.831	11.921	8.861	5.107
European administration	7.494	11.035	12.076	12.063	18.544
Businesses and institutions	9.460	3.984	5.851	4.833	3.949
Total	43.642	37.834	38.097	32.543	33.946

Horizon 2020: what lies ahead?

Although some of the projects funded via FP7 will run until 2019, the programme is now over. UPF has therefore turned its attention to Horizon 2020, the EC's new instrument for financing research and innovation, which, as Martín observes, "entails an evolution of FP7 and is divided into three separate sections, Excellent Science, Industrial Leadership and Societal Challenges".

The University is approaching Horizon 2020 "with a burning desire to keep on improving our success rate", affirms Lozano. "We want this to be the framework programme that consolidates UPF's position in the Champions League of research", he remarks. At the same time, the institution is aware of the challenges it faces. According to

Posas, they consist of "retaining our finest researchers against a backdrop of extreme competition from universities and centres with greater resources, in the USA and Asia as well as in Europe; and continuing to attract talent in a complex, changing environment".

At the moment, the highly competitive process triggered by the most recent call for applications for funding through the MINECO's Networks and Operators programme has resulted in UPF obtaining over €160,000 "to develop a participation promotion strategy and support project proposals geared to Horizon 2020", reports Martín. ■

FOUR OF UPF'S FP7 PROJECTS

CEEDS



CompMusic

“The project’s aim is to develop technologies for analysing and structuring musical information, particularly recordings and metadata”, says Xavier Serra, head of the Music Technology Research Group of the Department of Information and Communication Technologies (DTIC), which received an ERC Advanced Grant in 2010.

CompMusic has a major cultural aspect. “We want new technologies to aid understanding of non-western musical traditions, specifically Hindustani and Carnatic music from northern and southern India respectively, Turkish makam music, Arab-Andalusian music from the Maghreb, and Beijing opera”, explains Serra. To that end, his team is developing a web-based platform called Dunya, “via which it’ll be possible to explore collections of music from the five traditions we’re studying”.

Obtaining funding through FP7’s Ideas-ERC programme represents “a fantastic opportunity to carry out an ambitious research project bound by very few constraints, and recognition that opens numerous doors to a high-level academic career”, affirms Serra. “The distinction has contributed to the recognition of the academic field of music technologies, not just of my particular project”, he adds.

The Collective Experience of Empathic Data Systems (CEEDS) is a project that started in 2010 and that developed BrainX3, a simulation of the human brain. It works using the infrastructure of the eXperience Induction Machine (XIM) and VR (Virtual Reality) technology, allowing for large-scale interactive exploration in the field of neuroscience. Paul Verschure, director of the Synthetic Perceptive, Emotive, and Cognitive Systems group (SPECS) in Pompeu Fabra University (UPF), is the scientific director of the project, in charge of its scientific and technical management, and Pedro Omedas, member of SPECS, is its technical director.

XIM is an interactive space located in the facilities of the SPECS group in the UPF. It is capable of recreating numerous scenes, experiences, and digital and virtual contents and, at the same time, obtaining a large volume of data on the responses of users to the experiences, with the aim of identifying where they focus their attention and how they do so, thanks to a wide range of tactile, visual, and audio sensor systems.

The project studies individuals from a completely innovative perspective. As Verschure has explained: ‘the theoretical stance taken by CEEDS is based on the idea that presence is closely linked to the understanding of consciousness and, specifically, it starts with the principle that the construction of human experience is the result of the interaction of explicit and also implicit factors of the possible physical states of individuals’. This is a totally new approach using synthetic reality that requires the multidisciplinary participation of a group of experts in psychology, neuroscience, computer science, engineering, mathematics, and other disciplines.

CAND

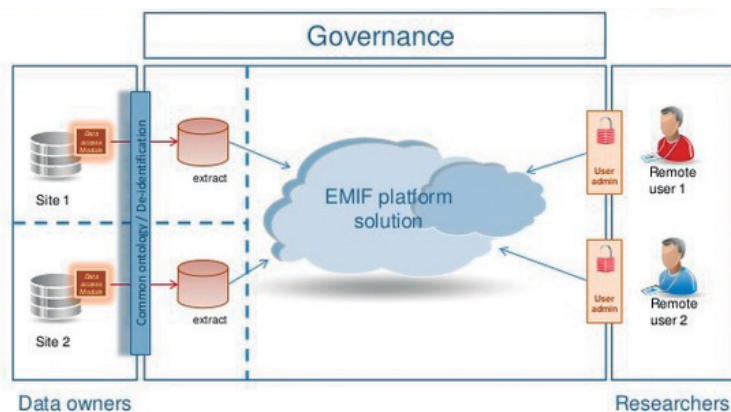
Collective Attitudes and Normative Disagreements (CAND) is a project supported by the Marie Curie fellowships under FP7. It is led by Teresa Marquès, under the supervision of Josep Joan Moreso, professor in the Department of Law of Pompeu Fabra University (UPF).

Receiving this recognition has helped ‘to promote the research I am developing and it has provided me with the freedom and the necessary conditions to carry it out, as well as giving more visibility to my work’, she explains.

CAND is about collective attitudes

and normative disagreements, a proposal that combines different philosophical disciplines with jurisprudence. Marquès claims that it will contribute to building bridges between two distant philosophical debates. On the one hand, ‘the debate taking place between the philosophy of language and meta-ethics, on the meaning and correct semantics of normative language. And on the other hand, the debate that has been taking place for some time now on the meaning of legal statements and legal disputes.’

EMIF



The project European Medical Information Framework (EMIF) 'has the aim of creating a space to allow for the efficient re-use of biomedical data', explains Ferran Sanz, director of the Research Programme on Biomedical Informatics (GRIB), participating centre linked to Pompeu Fabra University (UPF) and the Hospital del Mar Medical Research Institute (IMIM).

It represents an international commitment with more than 50 organisations from all over Europe, including hospitals, universities, government institutions, patients, and the pharmaceutical industry, and is framed within the FP7 Cooperation subprogramme.

'Currently, the vast quantity of information related to people's health opens up possibilities for progress in medical research and in the development of new treatments', Sanz points out; adding, however, that 'these data are stored in different repositories, located usually in an isolated way in different systems, using different code and natural languages.'

Through the EMIF the aim is to promote the Common Information Platform 'to enable access, connection, and analysis of clinical and biomedical research data, and the management of elements related to the use of data standards, semantic interoperability, or legal, ethical, and privacy aspects, to improve clinical practice for the benefit of the patients and of the population in general', states Sanz.

FirmsFluctuations

The exponential growth of international trade has made the world more globalized. The project Firms, International Trade, and Aggregate Fluctuations, coordinated by Julian de Giovani within the framework of the Marie Curie fellowships, aims to contribute to demonstrating the importance of studying the microeconomic foundations of macroeconomic fluctuations. On the other hand, it should also serve to contribute new knowledge in the field of economic policy.

'Globalization contributes to economic growth but also to an increase in the potential costs, like for example greater fluctuation in national economies', explains Julian de Giovani, researcher in the Department of Economics and Business. Moreover, he claims that 'large firms, producers of a substantial part of a country's total exports, contribute to the growth of trade.'

'Therefore, we are interested in studying how these firms and the international market affect the aggregate fluctuations of economies and the aggregate volatility of a country', he added. The project will provide a description and a methodology with detailed information on each individual firm in terms of the generation of aggregate fluctuations.

EUMSSI

'The coordination of a European project like Event Understanding through Multimodal Social Stream Interpretation (EUMSSI) is a challenge and involves ensuring that the taxpayer's money is being well spent on innovative research', explains Toni Badia, director of the Computational Linguistics Research Group (GLICOM) of the Department of Translation and Language Sciences.

The main objective is to facilitate the treatment of unstructured information, expressed in different formats (video, audio, and text, among others), 'for this

reason, the project devotes its efforts to improving extraction in each modality and, above all, being able to incorporate it in a unified semantic representation, with the aim of opening the path towards new models of information management', explains Badia.

On the one hand, Badia indicates that 'EUMSSI aims to become a support tool for journalistic research serving to search and select relevant multimedia documents, presenting them through a content-based recommendation system'. On the other hand, he adds that 'it provi-

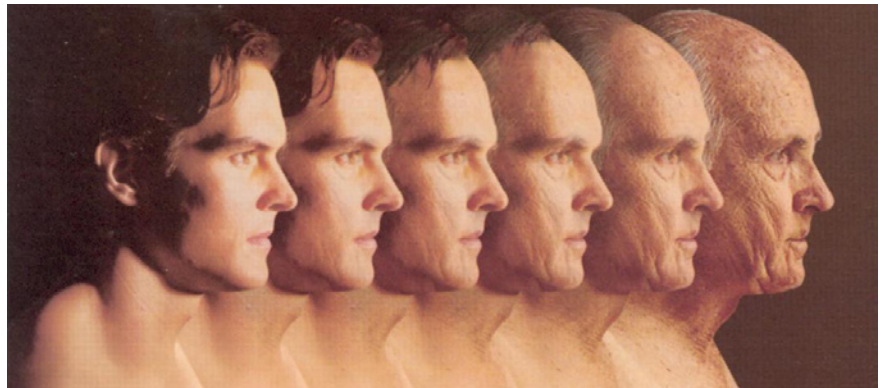
des a second screen for television viewers where they can access complementary documents and establish relationships through social networks, always using a content-based recommendation system'.

MYOAGE

The main objective of the project Understanding and Combating Age-Related Muscle Weakness, which ended in June 2013, is to understand the molecular mechanisms underlying neuromuscular functioning, both in normal physiological conditions and during ageing, using in vitro and in vivo models.

'In our laboratory we have studied the role of IL6, PAI-1, and p38 MAPK in relation to muscular ageing, and we determined the participation of the p38 signalling pathway and its four isomorphic forms in inflammatory response and the regulation of muscle mass in the ageing process', explains Pura Muñoz, head of the Cell Biology Research Group in the Department of Experimental and Health Sciences.

'Participating in this project has allowed us work together with the top leading centres in ageing in Europe. Our contribution to the team has resulted in seventeen research papers in prestigious and high-impact journals.'



One of the most noteworthy papers is that published by Pura Muñoz and other collaborators in the journal *Nature* (2014) on muscle stem cells and reversible quiescence in natural senescence, a paper in which they proposed the scientific basis for the reduction of the loss of muscle regeneration capacity among the elderly.

MediaAct

The Journalism Research Group (GRP) in the Department of Communication acted as state representative at the European consortium set up by the project Media Accountability and Transparency in Europe. 'Comparative research was carried out on accountability systems in information and communication media in Europe, both in the traditional media and in new systems emerging online', explains Salvador Alsius, professor in the department and member of the GRP.

Participation in the cooperative FP7 project has meant a boost for the research group 'as it has served as a bridge for connection and interaction with research groups in other countries that have similar objectives and methodologies', confirms Alsius. They formed part of the initiative, among other reasons, because the project coordinators from Dortmund saw the GRP's R&D results thanks to a book published in English. For this reason, Salvador Alsius is certain that 'it is vital to publish research results in English in order to have options to distribute them abroad.'

As an experience, participation in MediaAct 'has allowed us offer a series of data to students of media ethics and to journalism professionals which, without doubt, will help to improve the quality of information, understood as a social good worth preserving', says Alsius. On the other hand, it has also served as encouragement for the GRP to continue studying this line of research and to consider new projects.

StateBgLatAmerica

State Building in Latin America, carried out during the last five years (2009-2014), has closed its circle of activities with the presentation online and via open access of more than 50,000 documents gathered and catalogued throughout the research. These documents present economic and political processes generated through the independence of Latin American countries.

The project, supported by the European Research Council through an ERC Advanced Grant, was directed by Professor Juan Carlos Garavaglia, researcher from the Catalan Institution for Research and Advanced Studies (ICREA) working in the Department of Humanities of Pompeu Fabra University (UPF).

'This bibliographic collection is an exceptional resource which puts archive material from many Latin American countries within reach of the public. They

are particularly relevant documents for historians, economists, members of government and non-government organisations and, in general, for all those interested in obtaining reliable and accurate data and figures with regard to economic and political processes in Latin America, during the first decades after their independence', states Garavaglia.

The project consisted of a first phase in which reports from the Treasury, War, and Government departments for the period 1820-1870 were collected for a series of Latin American countries, among which we find Argentina, Chile, Colombia, Costa Rica, Ecuador, Guatemala, and Uruguay. As Garavaglia explained, 'the research tackles the issue of taxation as a starting point, later working on justice, bureaucracy, and war'.



LEAP

The LEAP (Learning of Archaeology through Presence) project is being led by Laia Pujol, under the supervision of Sandra Montón, an ICREA (Catalan Institution for Research and Advanced Studies) research professor from the Department of Humanities and the collaboration of Paul Verschure (SPECS-UPF) in the technical virtual reconstruction.

A beneficiary of the Marie Curie grant programme, LEAP accomplished a rare feat in obtaining 100 points, the highest score possible, in the application process. That is testimony to the quality of Pujol's research, although it also places her under a degree of extra pressure, "as the score will have generated great expectations at different levels and meeting them won't be easy", she remarks.

LEAP is a multidisciplinary initiative for "proposing a theoretical and methodological framework for the new field of knowledge called virtual archaeology, with a view to improving 3D reconstructions to aid our understanding of the societies of the past", Pujol explains.

She is in no doubt as to the direction she wants to take in the future. "I'd like to continue developing and consolidating LEAP's results, and to contribute to Catalonia gaining a firm foothold in virtual heritage's international arena."

PRIMATESvs

Tomàs Marquès-Bonet is currently an ICREA researcher and leader of the Comparative Genomics Research Group at the Institute of Evolutionary Biology (established by the Spanish National Research Council and UPF). In 2010, he obtained an ERC Starting Grant to "characterize genomic variation in great apes, such as chimpanzees, gorillas and orangutans, with the aim of contextualizing the genetic variability we see in humans today". Since then, he has led and participated in various studies that have had a worldwide impact in scientific circles. As the head of an international team that has sequenced the genomes of many individuals from the six great ape species of Africa and Southeast Asia, he published the project's main findings in the

Nature journal last year.

"My work clearly falls into the category of basic research, but the studies involved could further knowledge of diseases that only affect human beings", he explains.

Recognition in the form of an ERC grant "entails a local change because it lets you bring your conditions into line with those of researchers working in countries where there are funding opportunities, such as the starting packages American universities provide", he states. "When your funding runs out, you have to adapt to your new, modest research conditions, which means disbanding the group you've established", he adds.



Family Polarization



Gosta Esping-Andersen, professor in the Department of Political and Social Sciences, received an ERC Consolidator Grant in 2011 to study whether current demographic changes are generating social inequality. 'We are experiencing a noticeable increase in economic inequality and, moreover, we are seeing a change in the demographic behaviour of families, where low birth rates, remaining single, and couple instability are more and more frequent among persons with lower education levels', he confirms.

The project, which is in its third year, counts on the collaboration of research centres from Denmark, Italy, Great Britain, and Sweden, and the support of members of the Sociodemographics Research Group in Pompeu Fabra University (UPF), of which Esping-Andersen is director, as well as demographers from the Spanish National Research Council (CSIC).

Initially, changes in the demographic characteristics of families were studied through fertility and divorce. The project is now focusing attention on children, a very vulnerable group in this type of situation. 'Through the German GSOEP panel, we have analysed whether the investment of time on the part of the parents in the early stages of childhood influences subsequent educational results, and the data show that the effects are very strong', Esping-Andersen explains.

IMPART

"The film industry has evolved rapidly in the last 25 years, switching from analogue to digital technology, and is now facing an explosion in terms of the volume, variety and complexity of data", says Josep Blat, head of the DTIC's Interactive Technologies Research Group (GTI), which is carrying out the IMPART project. "We're researching and developing smart solutions to make interpreting, integrating and simplifying this vast, diverse quantity of data not only easier but also possible in real time, as well as to extend its creative use."

The GTI is coordinating the project, whose other participants include universities from the Czech Republic, the UK and Greece, as well as leading audiovisual sector firms. According to Blat, "fruitful cooperation between universities and businesses requires the two collectives to share certain objectives". He goes on to declare that "there needs to be an increase in both the quantity and quality of such cooperative arrangements if a country is to have a prominent international role".

While being IMPART's coordinating

FORECASTING

Barbara Rossi, researcher from the Catalan Institution for Research and Advanced Studies (ICREA) working in the Department of Economics and Business, is carrying out the project Forecasting: New Methods and Applications for Forecast Evaluation, thanks to an ERC Consolidator Grant, from the European Research Council.

Rossi explains that she 'is developing a tool that will become fundamental in economics, statistics, business, and other sciences, capable of identifying whether particular forecasts are good and robust, which is of great importance for guiding political and economic decisions, among others.' The project's main objective is to tackle important issues that researchers often encounter; for example, assessing the sustainability of their forecasts in the presence of instabilities, or whether the forecasts are optimal, and if they are not, how to improve them.

In this sense, obtaining robust methods for forecasts that are widely used in economic models is the first task of this project. The second is to study the calculation of uncertainty around the forecasts, especially relevant for political decision-makers. And the third involves the analysis of forecast tests for assessing models. Lastly, Rossi works on reorienting, through an empirical framework, models that do not forecast well, an essential element of the research.

group involves "major responsibility", Blat points out that "it is tremendously enriching to be participating directly, and in a privileged role, in the transition to digital cinematography". In that regard, "we have to drive and stimulate cooperative research and development to obtain innovative, applicable results that are better than those we'd achieve individually", he remarks.

LEAP

Learning of Archaeology
through Presence

www.upf.edu/leap

EMIF

European Medical Information
Framework

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EUMSSI

Event Understanding
through Multimodal Social
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CompMusic

Computational models
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CEEDS

Collective Experience
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MediaAct

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www.mediaact.eu

StateBgLatAmerica

A comparative history of the state
building process in Latin America
(1820-1870)

www.sgbl.upf.edu

PRIMATESVs

Identification and characterization of
primate structural variation and an
assessment of intra-specific patterns
of selection and copy-number
variation

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