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| CV Date | 17/01/2025 |
|---------|------------|

## Part A. PERSONAL INFORMATION

|                                            |                           |               |            |
|--------------------------------------------|---------------------------|---------------|------------|
| First Name                                 | Angel                     |               |            |
| Family Name                                | Goñi Moreno               |               |            |
| Sex                                        | Male                      | Date of Birth | 06/08/1983 |
| ID number Social Security, Passport        | 50119205C                 |               |            |
| URL Web                                    | www.biocomputationlab.com |               |            |
| Email Address                              | angel.goni@cnb.csic.es    |               |            |
| Open Researcher and Contributor ID (ORCID) | 0000-0002-2097-2507       |               |            |

### A.1. Current position

|                     |                                                                     |              |               |
|---------------------|---------------------------------------------------------------------|--------------|---------------|
| Job Title           | Investigador Científico                                             |              |               |
| Starting date       | 2024                                                                |              |               |
| Institution         | Consejo Superior de Investigaciones Científicas                     |              |               |
| Department / Centre | Centro Nacional de Biotecnología / Centro Nacional de Biotecnología |              |               |
| Country             | Spain                                                               | Phone Number | +34 910679186 |
| Keywords            | Biocomputer; Biological engineering; Biotechnology                  |              |               |

### A.2. Previous positions (Research Career breaks included)

| Period      | Job Title / Name of Employer / Country                                                                            |
|-------------|-------------------------------------------------------------------------------------------------------------------|
| 2020 - 2024 | Doctor Contratado programa Oficial (Atracción de Talento modalidad 1) / Universidad Politécnica de Madrid / Spain |
| 2016 - 2020 | Lecturer in Synthetic Biology / Newcastle University / United Kingdom                                             |

### A.3. Education

| Degree/Master/PhD                                                | University / Country                      | Year |
|------------------------------------------------------------------|-------------------------------------------|------|
| Programa Oficial de Doctorado en Ingeniería Informática          | Universidad Politécnica de Madrid / Spain | 2010 |
| Máster Universitario de Investigación en Inteligencia Artificial | Universidad Politécnica de Madrid         | 2010 |
| Ingeniero en Informática                                         | Universidad Politécnica de Madrid         | 2008 |

## Part B. CV SUMMARY

After the first-ever Thesis on Synthetic Biology at UPM (2010), I carried out two postdoctoral stays at [i] Manchester Metropolitan University (UK), and [ii] Centro Nacional de Biotecnología (Spain). I moved then to Newcastle University (UK, 2016) to establish my first group as Principal Investigator. I was awarded in 2017 the prestigious **First Grant Award** by the Engineering and Physical Sciences Research Council (EPSRC) and managed in the following years to secure funding as PI from both national (EPSRC, UK) and international (H2020, EU) sources. In 2020 I came back to Madrid winning an **Atracción de Talento** award from Comunidad de Madrid, for which I came 1st in the evaluation (BIO panel) and established the Biocomputation Lab at the Centre for Biotechnology and Plant Genomics (CBGP, UPM/CSIC). I was recently awarded an **ERC Consolidator Grant** and won a selection process for **Investigador Científico** (CNB-CSIC, 2024). Awarded with **Premio Investigación Comunidad de Madrid 2022** Margarita Salas, and the **Medal of the Royal Academy of Engineering** of Spain (2023).

I have also obtained funding as PI from national (Plan Estatal) and regional (Proyecto Sinérgico I+D from CM) sources, both finishing in 2024. Apart from developing my own Laboratory, I

have also contributed substantially to the CBGP success in getting the mention of excellence Severo Ochoa (2022-2025) which included a strong support for the newly funded Engineering Biology research line at the Centre - which I helped to establish myself. **My research operates at the crossroads of biology and computing**, employing mathematics, molecular biology, microbiology, physics, and engineering. The goal is to design and implement innovative algorithmic functions in living microbes, with a particular emphasis on contributing to a new chapter in the history of computation by harnessing the capabilities of living systems.

PI since 01/08/2016 (UK) and 01/09/2020 (Spain). Over 45 JCR publications. 4 PhD Thesis supervised + 3 ongoing. H-index = 23. Program Committee member in >15 conferences in my field. Co-funder of the European Synthetic Biology Society. Former Editor of the Synthetic Biology Open Language. Member of the Advisory Board at [i] the European Synthetic Cell Initiative, and [ii] the BioBit Program at Zhejiang University. Invited to influential meetings on synthetic biology e.g., OECD, NAS (US National Academy of Sciences), NATO, GESDA (EU think-tank). Science communication: Investigación y Ciencia, New Scientist, MIT Tech Review, Radio Nacional de España, ABC.

## Part C. RELEVANT ACCOMPLISHMENTS

### C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 **Scientific paper.** Huseyin Tas; Lewis Grozinger; Ruud Stoof; Victor de Lorenzo; (5/5) Angel Goñi-Moreno (AC). 2021. Contextual dependencies expand the re-usability of genetic inverters. Nature Communications. <https://doi.org/10.1038/s41467-020-20656-5>
- 2 **Scientific paper.** Ruud Stoof; (2/2) Angel Goni-Moreno (AC). 2020. Modelling co-translational dimerization for programmable nonlinearity in synthetic biology. Journal of the Royal Society Interface. 17-172. <https://doi.org/10.1098/rsif.2020.0561>
- 3 **Scientific paper.** Matthew Crowther; Lewis Grozinger; Matthew Pocock; et al; Anil Wipat; (9/10) Angel Goñi-Moreno (AC). 2020. ShortBOL: A Language for Scripting Designs for Engineered Biological Systems Using Synthetic Biology Open Language (SBOL). ACS Synthetic Biology. <https://doi.org/10.1021/acssynbio.9b00470>
- 4 **Scientific paper.** Belen Calles; (2/3) Angel Goñi-Moreno; Victor de Lorenzo. 2019. Digitalizing heterologous gene expression in Gram-negative bacteria with a portable ON/OFF module. Molecular Systems Biology. <https://doi.org/10.15252/msb.20188777>
- 5 **Scientific paper.** Lewis Grozinger; Martyn Amos; Thomas Gorochowski; et al; (10/10) Angel Goñi-Moreno (AC). 2019. Pathways to cellular supremacy in biocomputing. Nature Communications. <https://doi.org/10.1038/s41467-019-13232-z>
- 6 **Scientific paper.** Lewis Grozinger; Angel Goñi-Moreno. 2024. Turing patterns with cellular computers. Cell Systems. Elsevier. 15-12.
- 7 **Scientific paper.** Angel Goñi-Moreno. 2024. Biocomputation: Moving Beyond Turing with Living Cellular Computers. Communications of the ACM.
- 8 **Scientific paper.** Ana-Mariya Angel; Lorea Alejandre; (3/3) Angel Goñi-Moreno (AC). 2023. The Laboratory Automation Protocol (LAP) Format and Repository: A Platform for Enhancing Workflow Efficiency in Synthetic Biology. ACS Synthetic Biology. 12-12, pp.3514-3520.
- 9 **Scientific paper.** Matthew Crowther; Anil Wipat; (3/3) Angel Goñi-Moreno (AC). 2023. GENETTA: a Network-Based Tool for the Analysis of Complex Genetic Designs. ACS Synthetic Biology. 12-12, pp.3766-3770.

- 10 Scientific paper.** Lorea Alejaldre; Ana-Mariya Anhel; Angel Goñi-Moreno. 2023. pBLAM1-x: standardized transposon tools for high-throughput screening. *Synthetic Biology*. Oxford academic. 8-1.
- 11 Scientific paper.** Juhyun Kim; Victor de Lorenzo; (3/3) Angel Goñi-Moreno (AC). 2023. Pressure-dependent growth controls 3D architecture of *Pseudomonas putida* microcolonies. *Environmental Microbiology*. Wiley. <https://doi.org/10.1111/1758-2229.13182>
- 12 Scientific paper.** Esteban Martínez-García; Sofía Fraile; Elena Algar; et al; Víctor de Lorenzo; (19/22) Ángel Goñi-Moreno. 2022. SEVA 4.0: an update of the Standard European Vector Architecture database for advanced analysis and programming of bacterial phenotypes. *Nucleic Acids Research*. 51, pp.1558-1567. <https://doi.org/10.1093/nar/gkac1059>
- 13 Scientific paper.** Lewis Grozinger; Elizabeth Heidrich; (3/3) Ángel Goñi-Moreno (AC). 2022. An electrogenetic toggle switch model. *Microbial Biotechnology*. Wiley. <https://doi.org/10.1111/1751-7915.14153>
- 14 Scientific paper.** Matthew Crowther; Anil Wipat; (3/3) Angel Goñi-Moreno (AC). 2022. A Network Approach to Genetic Circuit Designs. *ACS Synthetic Biology*. 11-9, pp.3058-3066.
- 15 Scientific paper.** Jonathan Tellechea-Luzardo; Irene Otero-Muras; (3/4) Angel Goñi-Moreno; Pablo Carbonell. 2022. Fast biofoundries: coping with the challenges of biomanufacturing. *Trends in Biotechnology*. <https://doi.org/10.1016/j.tibtech.2021.12.006>
- 16 Scientific paper.** Huseyin Tas; Lewis Grozinger; (3/4) Angel Goñi-Moreno (AC); Victor de Lorenzo. 2021. Automated design and implementation of a NOR gate in *Pseudomonas putida*. *Synthetic Biology*. 6-1. <https://doi.org/10.1093/synbio/ysab024>
- 17 Scientific paper.** Juhyun Kim; (2/3) Angel Goñi-Moreno; Victor de Lorenzo. 2021. Subcellular Architecture of the xyl Gene Expression Flow of the TOL Catabolic Plasmid of *Pseudomonas putida* mt-2. *mBio*. <https://doi.org/10.1128/mbio.03685-20>
- 18 Scientific paper.** Hasan Baig; Pedro Fontanarosa; Vishwesh Kulkarni; et al; Chris Myers. 2020. Synthetic biology open language visual (SBOL visual) Version 2.2. *Journal of integrative bioinformatics*. De Gruyter.
- 19 Scientific paper.** Jacob Beal; (2/18) Angel Goñi-Moreno; Chris Myers; et al; Manuel Porcar. 2020. The long journey towards standards for engineering biosystems. *EMBO reports*. <https://doi.org/10.15252/embr.202050521>
- 20 Scientific paper.** Huseyin Tas; (2/3) Angel Goñi-Moreno; Victor de Lorenzo. 2020. A Standardized Inverter Package Borne by Broad Host Range Plasmids for Genetic Circuit Design in Gram-Negative Bacteria. *ACS Synthetic Biology*. <https://doi.org/10.1021/acssynbio.0c00529>
- 21 Scientific paper.** Bradley Brown; Bryan Bartley; Jacob Beal; et al; Anil Wipat; (5/13) Angel Goñi-Moreno. 2020. Capturing Multicellular System Designs Using Synthetic Biology Open Language (SBOL). *ACS Synthetic Biology*. <https://doi.org/10.1021/acssynbio.0c00176>

## C.2. Conferences and meetings

- 1** Angel Goñi-Moreno. Reprogramming genetic circuits using the cellular context. 7th Applied Synthetic Biology in Europe (ASBE). European Federation of Biotechnology. 2024. Czech Republic. Participatory - invited/keynote talk.
- 2** Hidden biological information around genetic circuits. International Symposium of Biological Computation. Zheijiang Laboratory. 2024. Participatory - invited/keynote talk.
- 3** Angel Goñi-Moreno. Characterising contextual information for circuit design. COMputational Modeling in Biology Network (COMBINE). 2021. Participatory - invited/keynote talk.
- 4** Ángel Goñi-Moreno. Genetic circuits beyond genes. Workshop on Computing among Cells. 2021. Participatory - invited/keynote talk.
- 5** >70 contributions to conferences, workshops and seminars; around 30 of which are invited talks.. Full list available at: [https://drive.google.com/file/d/1a1uJ2BgNCUyIthFfeyLbT5MbKFKFCdhl/view?usp=share\\_link](https://drive.google.com/file/d/1a1uJ2BgNCUyIthFfeyLbT5MbKFKFCdhl/view?usp=share_link).

## C.3. Research projects and contracts

- 1 **Project.** 101044360, Evolutionary Computing for Environmental Synthetic Biology - ERC Consolidator Grant. European Research Council (ERC). Angel Goñi-Moreno. (Universidad Politécnica de Madrid). 10/2022-09/2027. 2.131.809 €. Principal investigator.
- 2 **Project.** MULTI-SYNBIO: AUMENTAR LA EFICIENCIA DE CONSORCIOS SINTETICOS MULTICELULARES PARA BIOCOMPUTACION MEDIANTE LA IMPLEMENTACION DE DINAMICAS DE CONJUGACION PREDEFINIDAS. Ministerio de Ciencia e Innovación. Angel Goñi Moreno. (Centro Nacional de Biotecnología). 01/09/2024-31/08/2027. 287.500 €.
- 3 **Project.** BIOELECTRIC: Synthetic Biological Systems with Electronic Control. Ministerio de Ciencia e Innovación. Angel Goñi Moreno. (Centro Nacional de Biotecnología). 01/09/2023-31/08/2025. 199.631 €.
- 4 **Project.** 2019-T1/BIO-14053, CONTEXT - engineering context-aware synthetic biological circuits. Comunidad de Madrid. Angel Goñi Moreno. (Universidad Politécnica de Madrid). 01/09/2020-01/09/2024. 306.000 €. Principal investigator.
- 5 **Project.** PID2020-117205GA-I00, IMPLEMENTAR RELACIONES SOCIALES EN SISTEMAS MULTICELULARES SINTETICOS PARA ALCANZAR BIOCOMPUTACIONES ROBUSTAS Y FIABLES (MULTI-SYSBIO). Ministerio de Ciencia e Innovación. Angel Goñi-Moreno. (Universidad Politécnica de Madrid). 01/09/2021-31/08/2024. 120.000 €. Principal investigator.
- 6 **Project.** Y2020/TCS-6555, BIOLOGIA SINTETICA TRIDIMENSIONAL EN BACTERIAS DE BIOCONTROL AMBIENTAL (BIOSINT-CM). Comunidad de Madrid. Ángel Goñi-Moreno. (Universidad Politécnica de Madrid). 01/07/2021-30/06/2024. 672.980 €. Principal investigator.