

Part A. PERSONAL INFORMATION

CV date

05/04/2022

First and Family name	María Esther Reina Romo		
Social Security, Passport, ID number		Age	
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0002-5714-465X	
	SCOPUS Author ID (*)	24778428300	
	WoS Researcher ID (*)	E-7010-2010	

(*) *Optional*

(**) *Mandatory*

A.1. Current position

Name of University/Institution	University of Seville		
Department	Departamento de Ingeniería Mecánica y de Fabricación /Escuela Técnica Superior de Ingeniería		
Address and Country	Camino de los Descubrimientos s/n. 41092 Sevilla. Spain		
Phone number	954487311	E-mail	erreina@us.es
Current position	Full professor	From	27/07/2021
Key words	Biomechanics, mechanobiology, bone, finite element		

A.2. Education

PhD, Licensed, Graduate	University	Year
Mechanical Engineer	University of Seville	2005
PhD Mechanical Engineer	University of Seville	2010

A.3. General indicators of quality of scientific production (see instructions)

- Total citations: 785 (Google Scholar), 538 (Scopus)
- h-Index: 17 (Google Scholar), 15 (Scopus)
- Publications (JCR journal): Total: 38, Q1: 19, Q2: 13; 6 international book chapters.
- Principal investigator of 5 research projects (4 national y 1 regional)
- Number of research "sexenios"/date of last "sexenio": 2 / 31-12-2018
- Number of PhD thesis supervised: 3 (and currently supervising 2 PhD theses)

Part B. CV SUMMARY (max. 3500 characters, including spaces)

I have studied Mechanical Engineering at the University of Seville obtaining the third best academic record of the XXXIV promotion. After finishing my studies in 2005, I started my PhD under the supervision of Dr. Jaime Domínguez Abascal (University of Seville) and Dr. José Manuel García Aznar (University of Zaragoza). During this pre-doctoral stage, I spent 1 year at the Institute of Engineering Research of Aragon and 3 months at the University College of London. I finished my PhD in 2010, obtaining the extraordinary PhD award from the University and the award for the best doctoral thesis from the Seville City Council.

I have worked mainly on the development of mathematical models and computational implementation of bone regeneration processes in the field of biomechanics and mechanobiology. I have also been involved in the *in vivo* characterization of such processes through *in vivo* experiments. The results of these works are collected in more than 35 JCR publications and a patent. So far, I have supervised 3 doctoral theses, one of which has received the extraordinary doctoral award. I have also been principal investigator of 4 research projects (national and regional plan) and a member of the research team of 5 research projects in different fields.

All these contributions have been recognized with different awards and distinctions such as the national research award Juan Carlos Simó 2017 or the Royal Academy of Sciences Seville 2015, among others.

I am full professor of Mechanical Engineering since 2021 and a visiting professor at the Universities of Colorado (2011) and Liège (2018). I have given invited lectures at the Instituto



Superior Técnico in Lisbon (2012), University College of London (2009) and at the University of Seville (2016, 2017).

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (10 most relevant publications)

1. Blázquez-Carmona P, Sanz-Herrera JA, Mora-Macías J, Morgaz J, Domínguez J, Reina-Romo E (2022) Time-dependent collagen fibered structure in the early distraction callus: imaging characterization and mathematical modeling. *Ann Biomed Eng.* <https://doi.org/10.1007/s10439-022-02992-3>.
2. Reina-Romo E, Mandal S, Amorim PA, Bloemen V, Ferraris E, Geris L (2021) Towards the experimentally-informed in silico nozzle design optimization for extrusion-based bioprinting of shear-thinning hydrogels. *Front Bioeng Biotechnol.* 9: 701778.
3. P. Blázquez-Carmona, J. Mora-Macías, J.A. Sanz-Herrera, J. Morgaz, R. Navarrete-Calvo, J. Domínguez, E. Reina-Romo (2020). Mechanical Influence of Surrounding Soft Tissue on Bone Regeneration Processes: A Bone Lengthening Study. *Ann Biomed Eng.* doi: 10.1007/s10439-020-02592-z.
4. P. Blázquez-Carmona, J. Mora-Macías, J. Morgaz, J.A. Fernández-Sarmiento, J. Domínguez, E. Reina-Romo (2020). Mechanobiology of bone consolidation during distraction osteogenesis: bone lengthening versus bone transport. *Ann Biomed Eng.* doi: 10.1007/s10439-020-02665-z.
5. J. Mora-Macías, P. García-Florencio, A. Pajares, P. Miranda, J. Domínguez, E. Reina-Romo (2020). Elastic Modulus of Woven Bone: Correlation with Evolution of Porosity and X-ray Greyscale. *Annals of Biomedical Engineering.* doi: 10.1007/s10439-020-02529-6.
6. J.A. Sanz-Herrera, E. Reina-Romo, A.R. Boccaccini (2018). In silico design of magnesium implants: Macroscopic modeling. *J Mech Behav Biomed Mater.* Vol 79, pp 181-188.
7. López-Pliego, E M; Mora-Macías, J; Giráldez-Sánchez MA; Domínguez, J; Reina-Romo, E (2018). Histological study of the docking site after bone transport. Temporal evolution in a sheep model. *Injury.* Vol 49, pp 1987-1992.
8. Mora-Macías J; Pajares A; Miranda P; Domínguez J; Reina-Romo E. (2017) Mechanical characterization via nanoindentation of the woven bone developed during bone transport. *J Mech Behav Biomed Mater.* *J Mech Behav Biomed Mater.* Vol 74, pp. 236-244.
9. J. Mora-Macías, E. Reina-Romo, J. Morgaz, J. Domínguez (2015). *In vivo* gait analysis during bone transport. *Ann Biomed Eng.* Vol 43, pp 2090-100.
10. E. Reina-Romo, M.J. Gómez-Benito, J. Domínguez, F. Niemeyer, T. Wehner, U. Simon, L.E. Claes. (2011). Effect of the fixator stiffness on the young regenerate bone after bone transport: computational approach. *Journal of Biomechanics.* Vol. 44, pp. 917–923.

C.2. Research projects (as principal investigator)

1. *Title:* El papel de la mecánica en la osteoporosis: un modelo de distracción osteogénica en ovejas ovariectomizadas
Reference: PID2020-113790RB-I00
Funding agency: Ministerio de Economía y competitividad.
Duration: 01/09/2021-31/08/2024.
Amount: 196867 € plus a PhD grant for 4 years
2. *Title:* Ingeniería de Tejidos Para la Corrección de Grandes Defectos Óseos: Modelado In Silico e In Vivo
Reference: US-1261691
Funding agency: Proyectos I+D+i FEDER Andalucía 2014-2020
Duration: 01/01/2020-31/12/2021.
Amount: 87.200€.
3. *Title:* Reparación de Grandes Defectos Óseos: Transporte Óseo Versus Andamios Bioimprimidos Paciente Personalizados



Reference: DPI2017-82501-P

Funding agency: Ministerio de Economía y competitividad.

Duration: 01/01/2018-31/12/2020.

Amount: 123420 € plus a PhD grant for 4 years

4. *Title:* Modelos de Comportamiento del Tejido Óseo Inmaduro en el Callo de Distracción Ósea

Reference: PI2014-58233-P

Funding agency: Ministerio de Economía y competitividad.

Duration: 01/01/2015-31/12/2017.

Amount: 169400 € plus a PhD grant for 4 years

5. *Title:* Diseño, Construcción y Validación de Plataforma Biomimética para la Evaluación y Optimización de Constructos de Ingeniería Tisular para Reparación de Cartílago Articular

Reference: DPI2010-20399-C04-02.

Funding agency: Ministerio de Ciencia e Innovación. Plan Nacional del 2010.

Duration: 01/01/2011-31/12/2013.

C.3. Contracts, technological or transfer merits

1. Realización de ensayos de calificación y revisión de cálculos mecánicos. Abengoa S.A. Carlos Navarro Pintado (Universidad de Sevilla). 2019-2020. 72600 EUR. Research member.
2. Realización de ensayos de calificación sobre flexibles. Abengoa S.A. Carlos Navarro Pintado (Universidad de Sevilla). 2019-2020. 9650 EUR. Research member.
3. 2ª Ampliación del Proyecto Análisis del diseño mecánico, elaboración del diseño estructural, análisis dinámico y asesoramiento en la construcción y pruebas del sistema procesador de bioetanol. Hynergreen Technologies S.A. Dominguez-Abascal, Jaime (Universidad de Sevilla). 2011-2013. 144 000 EUR. Research member.
4. Ampliación del Proyecto Análisis del diseño mecánico, elaboración del diseño estructural, análisis dinámico y asesoramiento en la construcción y pruebas del sistema procesador de bioetanol. Hynergreen Technologies S.A. Dominguez-Abascal, Jaime (Universidad de Sevilla). 2010-2011. Research member.
5. Análisis del diseño mecánico, elaboración del diseño estructural, análisis dinámico y asesoramiento en la construcción y pruebas del sistema procesador de bioetanol. Hynergreen Technologies S.A. Dominguez-Abascal, Jaime (Universidad de Sevilla). 2009-2010. 169 000 EUR. Research member.

C.4 Work supervision

PhD supervision

- *Author:* Pablo Blázquez Carmona. *Title:* "Mechanobiology of bone regeneration: distraction osteogenesis and tissue engineering", 2022.
- *Author:* Juan Mora Macías. *Title:* "Biomechanics of bone transport: *in vivo*, *ex vivo* and numerical characterization", 2016. Extraordinary PhD award.
- *Author:* Macarena López Pliego. *Title:* "Osteogénesis por distracción con mantenimiento de la actividad motriz: estudio histológico de la estructura del callo y el docking site", 2016.

Supervision of 15 master theses.

C.5. Patents

Pardo Pardo, C., Ordoñez Fernandez A, Valverde Pérez I, Pardo Prieto SI, Mora Macías J, Reina-Romo E, Domínguez J. Dispositivo de control de flujo de sangre en un vaso sanguíneo. 2017-01-19. Universidad de Sevilla.



C.6 Research stays abroad

1. Visiting associate professor. Biomechanics and Computational Tissue Engineering. Department of Aerospace and Mechanical Engineering. University of Liege (Belgium). March-August 2018 (6 months).
2. Post-Doc College of Engineering and Applied Sciences, University of Colorado at Boulder, Boulder CO, USA. Jul-2011 to Ago-2011.

C.7. Prizes and distinctions

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| 2023 | Finalist of ERC Consolidator grant 2023. |
| 2022 | Losada Villasante award in the Scientific Research Category. |
| 2021 | Finalist of ERC Consolidator grant 2021. |
| 2017 | Juan C. Simo prize. Spanish ECCOMAS Association of Numerical Methods in Engineering. |
| 2015,16 | X, XI Business Idea competition prize in the field of biomechanics. University of Seville |
| 2015 | Royal academy award for Young Researchers. Seville. |
| 2010 | Award from Seville City Hall for the best doctoral thesis in Seville. |
| 2010 | Best doctoral thesis award 2009/10 at University of Seville. |
| 2005 | Award for the third best academic record at U. Seville for the degree of Industrial Engineering. |

C.8. Evaluation and committees

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| 2021 | Invited expert and evaluator of Postdoctoral grants. University Carlos III (Madrid). |
| 2020 | Member of the scientific Advisory Board of “Ramón y Cajal” program. Panel: PIN-INA. |
| 2010–2021 | Invited expert and evaluator of R&D projects (> 40 projects). Spanish State Research Agency. |
| 2010–current | Ad-hoc reviewer for over 16 journals, including Acta Biomaterialia, Biomechanics & Modeling in Mechanobiology or Journal of Biomechanics. |
| 2020-current | Member of the Reviewer Board of <i>Applied Sciences</i> . |
| 2019 – 2021 | Member selection board for the best PhD thesis prize. Spanish ECCOMAS Association of Numerical Methods in Engineering (SEMNI). |
| 2018 | Member of the Scientific Advisory Board of R&D projects. Spanish State Research Agency. |
| 2017–current | Member of selection committee for academic positions in the University of Seville, the University of Granada and the University of Valencia. |
| 2012 | External scientific evaluator of research projects. Portuguese Science, Technology Foundation. |
| 2011–current | Member of examination committees for PhD degrees in the University of Seville, the University of Zaragoza, the University of Extremadura, the University of Liege (Belgium). |

C.9. Institutional responsibilities

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| 202 –current | Coordinator of the new master program for the Biomedical Engineering degree, U. Seville. |
| 2021–current | Permanent panel member (out of 4) of the Spanish State Research Agency for coordination, Evaluation and Scientific and Technical Monitoring. Panel: Mechanical, Naval and Aerospace Engineering (PIN-INA). Spanish Ministry of Science. |
| 2022 | Head of the Advisory Board of “Ramón y Cajal” program (grants for postdoctoral work contracts of the Spanish State Research Agency). Panel: PIN-INA. |
| 2022 | Head of selection committee for María Zambrano/Margarita Salas/requalification grants. University Carlos III (Madrid). Panel: Industrial, Aerospace and Biomedical Engineering. |
| 2018–current | Member of the Faculty Committee “Doctorate Program in Mechanical and Industrial Organization Engineering”. University of Seville |