

CURRICULUM VITAE ABREVIADO (CVA)

Part A. PERSONAL INFORMATION

First name	Sergio		
Family name	Sanchez-Moral		
Gender (*)	Man	Birth date (dd/mm/yyyy)	29/08/1967
Social Security, Passport, ID number	00416189G		
e-mail	ssmilk@mncn.csic.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-7382-3441		

(*) *Mandatory*

A.1. Current position

Position	Research Fellow (tenured) (Investigador Científico)		
Initial date	01/07/2005		
Institution	Spanish National Research Council (CSIC)		
Department/Center	Geology / National Museum of Natural Sciences		
Country	Spain	Teleph. number	914111328
Key words	Geochemical modeling, Karst (Subterranean Ecosystems), Geomicrobiology, Isotopic geochemistry, Microclimate		

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
1990-1996	Predoctoral fellow/MNCN-CSIC/Spain
1996-1998	Associate Professor/Univ. Alcala/Spain
1999	Postdoctoral Contract/University of Antwerp/Belgium
1996-2001	Postdoctoral fellow/MNCN-CSIC/Spain
2002-2005	Postdoctoral Contract RyC/ MNCN-CSIC/Spain
2005-2009	Senior Scientist/ MNCN-CSIC/Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD Geological Sciences	Universidad Complutense de Madrid /Spain	1994
Licensed Geological Sciences	Universidad Complutense de Madrid/Spain	1990
BSc in Geological Sciences	Universidad Complutense de Madrid/Spain	1989

Part B. CV SUMMARY (max. 5000 characters, including spaces)

Dr. S. Sanchez-Moral is a Research Scientist at the Department of Geology of the National Museum of Natural Sciences (CSIC). He holds a BSc and a PhD in Geology from the Complutense University of Madrid.

With over 30 years of experience, his research has focused on low-temperature biogeochemical modeling, encompassing isotope geochemistry, geomicrobiology, and environmental microbiology. As the former leader of the Geology Department at MNCN-CSIC (2013-2016), he successfully oversaw and coordinated research activities. Currently, he serves as the Responsible Researcher and Scientific Supervisor for the Geological Laboratories at MNCN-CSIC.

Since 2008, he is the Researcher in charge of the CSIC-Research Group "Geoenvironmental records of Global Change and Georisks." The group's objectives include documenting, analyzing, and modeling past, present, and future earth- and transitional environments. Their focus involves evaluating the effects of geologic, hydrologic, geochemical processes, and anthropic activities causing changes in the environment. The group's activities are positioned



at the junction of the three main global knowledge areas (S-V-M) and were evaluated as B+ (time period 2012-2016). Specific goals cover subjects such as studying biogeochemical exchange mechanisms of greenhouse gases, environmental-biogeochemical monitoring of earth ecosystems, applying isotopic chemistry to quantify exchange fluxes of GHGs, and developing nature-based solutions for GHG removal or storage.

Dr. Sanchez-Moral has played a key role in both collaboration agreements and research projects, overseeing a total of 25 agreements and contracts with public and private institutions. This effort has resulted in securing substantial funding, with a total amount of €1,602,777. Additionally, he has directed 13 research projects, which encompassed initiatives such as the European project EST/02/0395: Advanced research training on the conservation of cultural heritage. This project, along with others under his guidance, had a budget exceeding 1 million euros.

He also coordinated and led the research teams of Altamira cave from 2002 to 2012, showcasing scientific research applied to the Conservation of Heritage. The results of the multidisciplinary study carried out in this agreement have been crucial for the preventive conservation plan currently governing access to the Altamira cave. The comprehensive report of the study was published by the Ministry of Culture

(<https://sede.educacion.gob.es/publiventa/estudio-integral-del-estado-de-conservacion-de-la-cueva-de-altamira-y-su-arte-paleolitico-2007-2009-perspectivas-futuras-de-conservacion/arqueologia-prehistoria/20122C>)

His scientific production includes publications in high-impact international journals such as Science, Nature Communications, PNAS, Science of total Environment, Naturwissenschaften, Biogeosciences, Agricultural & Forest Meteorology, among others. Dr. Sanchez-Moral collaborates regularly with evaluation agencies in public calls, both national and regional (ANEP and others), and serves as a reviewer for numerous international publications.

Since 2012, he has served as a Professor and Supervisor in the CERA Doctoral Program (Climate, Energy, and Environmental Risk) at the Department of Physics and Mathematics of the University of Alcalá. During this time, he has successfully supervised the research of 4 PhD students. The topics covered in these doctoral theses span from examining the climate and physical aspects of gas exchanges between the atmosphere, soil, and subsoil to investigating the role of microorganisms in regulating the concentration and exchange flows of greenhouse gases within sediments, water, and air in the critical zone. The academic training and scientific contributions made by these students during their PhD studies have played a crucial role in shaping their professional careers. Notably, they have gone on to contribute significantly in academic institutions such as the University of Almería and IGME-CSIC.

These contributions clearly demonstrate his capability leading research articles, supervising young researchers, building a multidisciplinary team, coordinating research projects and contracts, and transferring knowledge and technology to society.

Some indicators of his scientific activity include:

- N° six-year research periods: 5 (last six-year period 2017-22)
- Number of supervised doctoral theses in the last 10 years: 3
- JCR articles (<50% as first-last-corresponding author): 141 Total documents - 130 in WOS Core Collection publications
- Total publications in first quartile (Q1): 75, of which 48 are in journals of the first quartile (Q1) according to the SJR index and 48 according to JIF
- h-Index H: 40 (Scopus) 38 (WOS)
- Other indicators: 1 complete book, 39 articles in non-SCI journals (national and international), 62 book chapters, 143 communications to congresses (national and international), PI of 5 National Plan Projects + 1 Explora Project.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

- (1) Martin-Pozas, T., Cuezva, S., Fernandez-Cortes. A., ... , **Sánchez-Moral, S.** Role of subterranean microbiota in the carbon cycle and greenhouse gas dynamics. Science of the Total Environment 831 (2022) 154921. (10/10).



- (2) **Sanchez-Moral, S.**, Jurado, V., Fernandez-Cortes, A., Cuezva, S., Martin-Pozas, T., Gonzalez-Pimentel, J.L., Ontañón, R., Saiz-Jimenez, C. Environment-driven control of the dispersal of fungi in subterranean ecosystems: the case of La Garma Cave (northern Spain). International Microbiology (2021). <https://doi.org/10.1007/s10123-021-00193-x>
- (3) Martin-Pozas, T., **Sanchez-Moral, S.**, Cuezva, S., ... Fernandez-Cortes, A.. Biologically mediated release of endogenous N₂O and NO₂ gases in a hydrothermal, hypoxic subterranean environment. Science of the Total Environment 747, (2020) 141218. (2/11).
- (4) **Sanchez-Moral, S.**, Cañaveras, J.C., Benavente, D., ... Saiz-Jimenez, C. A study on the state of conservation of the Roman Necropolis of Carmona (Sevilla, Spain). Journal of Cultural Heritage, 34 (2018): 185-197. (1/9)
- (5) Fernandez-Cortes, A*, Cuezva, S., Alvarez-Gallego, M., **Sanchez-Moral, S.** Subterranean atmospheres may act as daily methane sinks. Nature Communications (2015), 6: 7003. (9/9).
- (6) Saiz-Jimenez, C., Cuezva, S., Jurado, V., Fernandez-Cortes, A., Porca E., Benavente, D., Cañaveras, J.C., **Sanchez-Moral S.** (2011) Paleolithic Art in Peril: Policy and Science Collide at Altamira Cave. Science, 334 (6052): 42-43.
- (7) **Sanchez-Moral, S.**, M.C. Portillo, I. Janices, S. Cuezva, A. Fernández-Cortés, J.C. Cañaveras, J.M. Gonzalez. The role of microorganisms in the formation of calcitic moonmilk deposits and speleothems in Altamira Cave. Geomorphology 139-140 (2012): 285-292.
- (8) **Sánchez-Moral, S.**; Luque, L.; Cuezva, S.; Soler, V.; Benavente, D.; Laiz, L.; Gonzalez, J.M.; Saiz-Jimenez, C. Deterioration of building materials in Roman catacombs: The influence of visitors. Science of the Total Environment, 349 (2005): 260– 276
- (9) **Sánchez-Moral, S.**; Soler, V.; Cañaveras, J.C.; Sanz-Rubio, E.; Van Grieken, R.; Gysells, K. Inorganic deterioration affecting Altamira Cave. Quantitative approach to wall-corrosion (solucional etching) processes induced by visitors. Science of the Total Environment, 243 (1999): 67-84.

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

INVITED CONFERENCE: **Cambio global y Patrimonio subterráneo: riesgos asociados a los Gases de Efecto Invernadero (GEI)**

CONGRESS ORGANIZING ENTITY: Royal Academy of Exact, Physical, and Natural Sciences of Spain (RACEFNE)

DATE: 21/06/2023

ORAL PRESENTATION: **Isotopic tracking of condensation, infiltration and interstitial water to detect microbial activity in caves**

CONGRESS ORGANIZING ENTITY: EGU General Assembly

DATE: 24/04/2023

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

EST/02/0395: Advanced research training on the conservation of cultural heritage.

FUNDING ENTITY: UE - Host fellowships for early stage research training

DURATION: 2005- 2009 GRANT AMOUNT: 263.292 €

PRINCIPAL INVESTIGATOR: **S. Sánchez-Moral** (MNCN-CSIC) Supervisor of topic: Geology, Hydrochemistry And Microclimate Of Hypogean Monuments.



CGL2010-17108/BTE: Variabilidad temporal de la concentración de CO2 en sistemas kársticos: Mecanismos de interacción subsuelo-atmosfera e implicaciones en el balance global del Carbono.

FUNDING ENTITY: Ministerio de Ciencia e Innovación.
DURATION: 2010 - 2013 GRANT AMOUNT: 141.570 €
PRINCIPAL INVESTIGATOR: **S. Sánchez-Moral** (MNCN-CSIC)

CGL2013-43324-R: Exploración y seguimiento de CO2 y CH4 en ambientes subterráneos

FUNDING ENTITY: Ministerio de Economía y competitividad.
DURATION: 2014 - 2016 GRANT AMOUNT: 152.460€
Investigador Principal: **S. Sánchez-Moral** (MNCN-CSIC)

CGL2016-78318-C2-1-R: caracterización de los procesos reguladores de la producción y consumo de Gases de efecto invernadero (GEI's) en ambientes subterráneos y su interacción con la atmosfera.

FUNDING ENTITY: Ministerio de Econom
DURATION: 2016 - 2019 GRANT AMOUNT: 121.000€
PRINCIPAL INVESTIGATOR: **Sergio Sánchez-Moral** (MNCN-CSIC)

PID2019-110603RB-I00, Control ambiental de la actividad microbiana en ecosistemas naturales subterráneos: implicaciones en flujos de geis, detección de bioseñales y estrategias de conservación

FUNDING ENTITY: Ministerio de Ciencia e Innovación
DURATION: 2020 - 2023 GRANT AMOUNT: 226.270€
PRINCIPAL INVESTIGATOR: **S. Sánchez-Moral** (MNCN-CSIC)

C.4. Contracts, technological or transfer merits, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

Estudio integral del estado de conservación de la Necrópolis de Carmona

EMPRESA/ADMINISTRACION FINANCIADORA: Junta de Andalucía
DURACION DESDE: 2007 HASTA: 2009
CUANTÍA SUBVENCIÓN: 148.702 €
INVESTIGADOR RESPONSABLE: **S. Sánchez-Moral** (MNCN-CSIC)

Estudio integral del estado de conservación de la Cueva de Altamira y sus representaciones artísticas paleolíticas. Perspectivas futuras de conservación

EMPRESA/ADMINISTRACION FINANCIADORA: Ministerio de Cultura
DURACION DESDE: 2007 HASTA: 2009
CUANTÍA SUBVENCIÓN: 367.075 €
INVESTIGADOR RESPONSABLE: **S. Sánchez-Moral** (MNCN-CSIC)

Seguimiento Ambiental y Estudio Geológico del Monumento Natural "Cueva de Castañar"

ADMINISTRACION FINANCIADORA: Junta de Extremadura
DURACION DESDE: julio 2014 HASTA: octubre 2015
CUANTÍA SUBVENCIÓN: 89.966,77 €
INVESTIGADOR RESPONSABLE: **S. Sánchez-Moral** (MNCN-CSIC)

Monitorización microambiental de la Cueva de La Garma

ADMINISTRACION FINANCIADORA: SOCIEDAD REGIONAL DE EDUCACIÓN,
CULTURA Y DEPORTE, S.L.
DURACION DESDE: febrero 2015 HASTA: agosto 2017
CUANTÍA SUBVENCIÓN: 98.950,23 €
INVESTIGADOR RESPONSABLE: **S. Sánchez-Moral** (MNCN-CSIC)

Instalación de un sistema de sensores en el sótano arqueológico del museo Carmen Thyssen de Málaga para toma de datos, análisis y adopción de medidas correctoras del deterioro.

ENTIDAD FINANCIADORA: Ayuntamiento de Málaga
DURACION DESDE: 01-12-2020 HASTA: 30-11-2021
CUANTÍA SUBVENCIÓN: 47.795€
INVESTIGADOR RESPONSABLE: **Sergio Sánchez-Moral** (MNCN-CSIC)
