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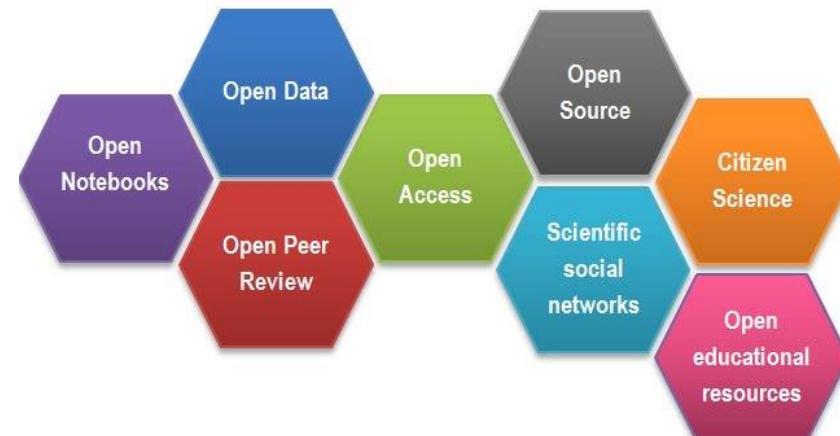
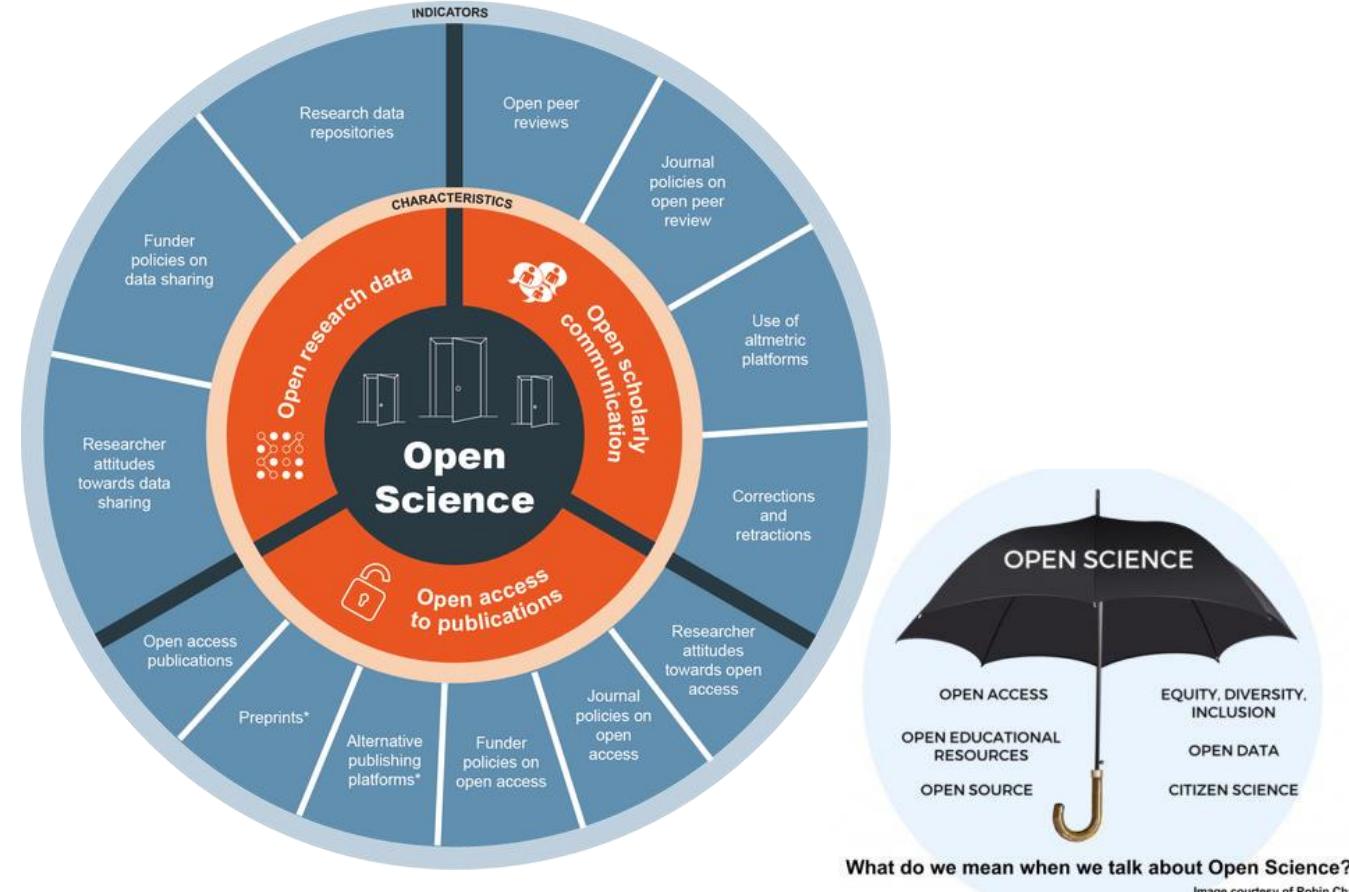


We will talk about...

- Open Science
 - What is it?
 - Benefits
- Open Access:
 - Legal framework
 - Creative Commons Licenses
 - Open access routes
- Publishing:
 - Before publication
 - Where?
 - Publishers' policies
 - Versions of the document
- Open Access at the UAB
- Open research data
- Good practices and suggestions

Open Science

- New approach to scientific research based on cooperative workflows and new ways of dissemination through digital technologies and collaborative tools
- Stronger interaction between researchers and society
- Higher productivity, efficiency and transparency
- Better response to research needs in all areas





Open access: what is it?

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Budapest Manifesto, February 2002

Open access ≠ Free access

Open access: benefits

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Gives back to **society** the investment made in research.



Preserves research results in the long term.



Open access: legal framework

- Real decreto 99/2011, de 28 de enero, por el que se regulan las enseñanzas oficiales de doctorado.



- Ley 17/2022, de 5 de septiembre, por la que se modifica la Ley 14/2011, de 1 de junio, de la Ciencia, la Tecnología y la Innovación. Artículo 37

- Plan Estatal de Investigación Científica y Técnica y de Innovación (PEICTI) 2021-2023



- Llei 9/2022, del 21 de desembre, de la ciència



- Horizon Europe (2021-2027)

- Política institucional d'accés obert de la Universitat Autònoma de Barcelona (2022)
- Política institucional de dades de recerca en obert de la UAB (2020)

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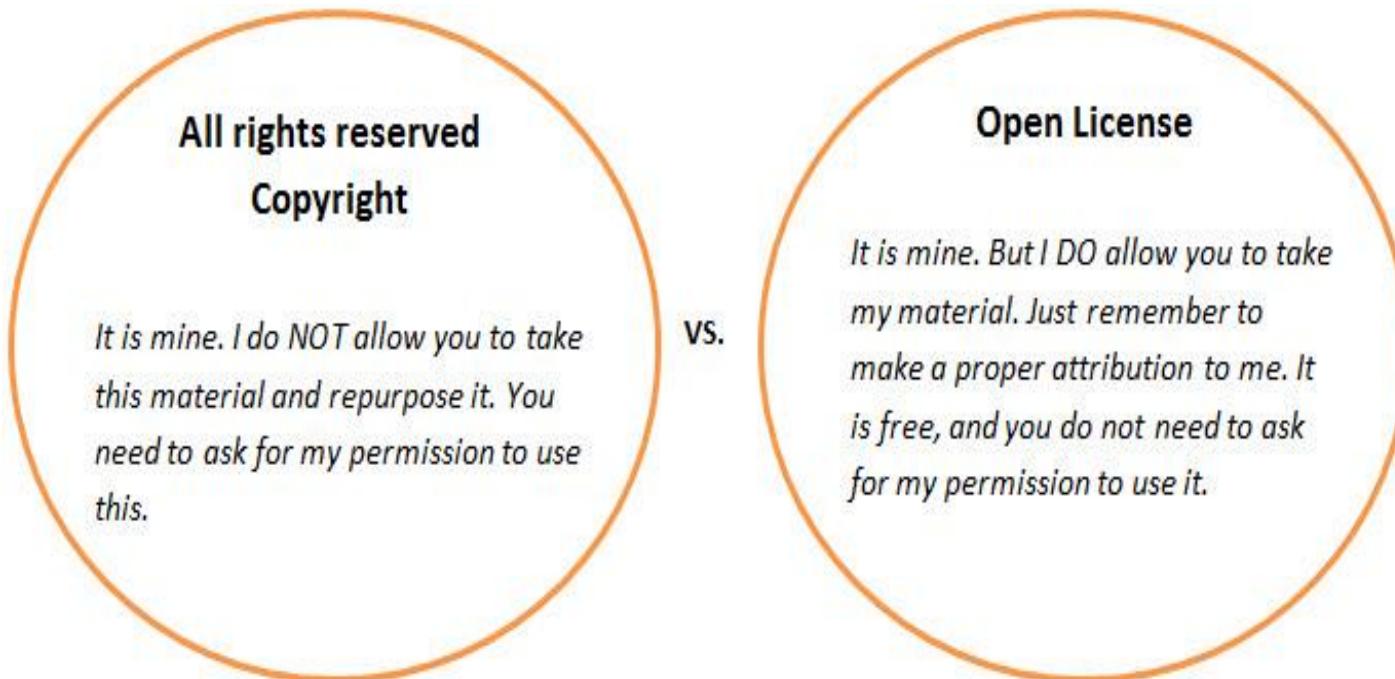


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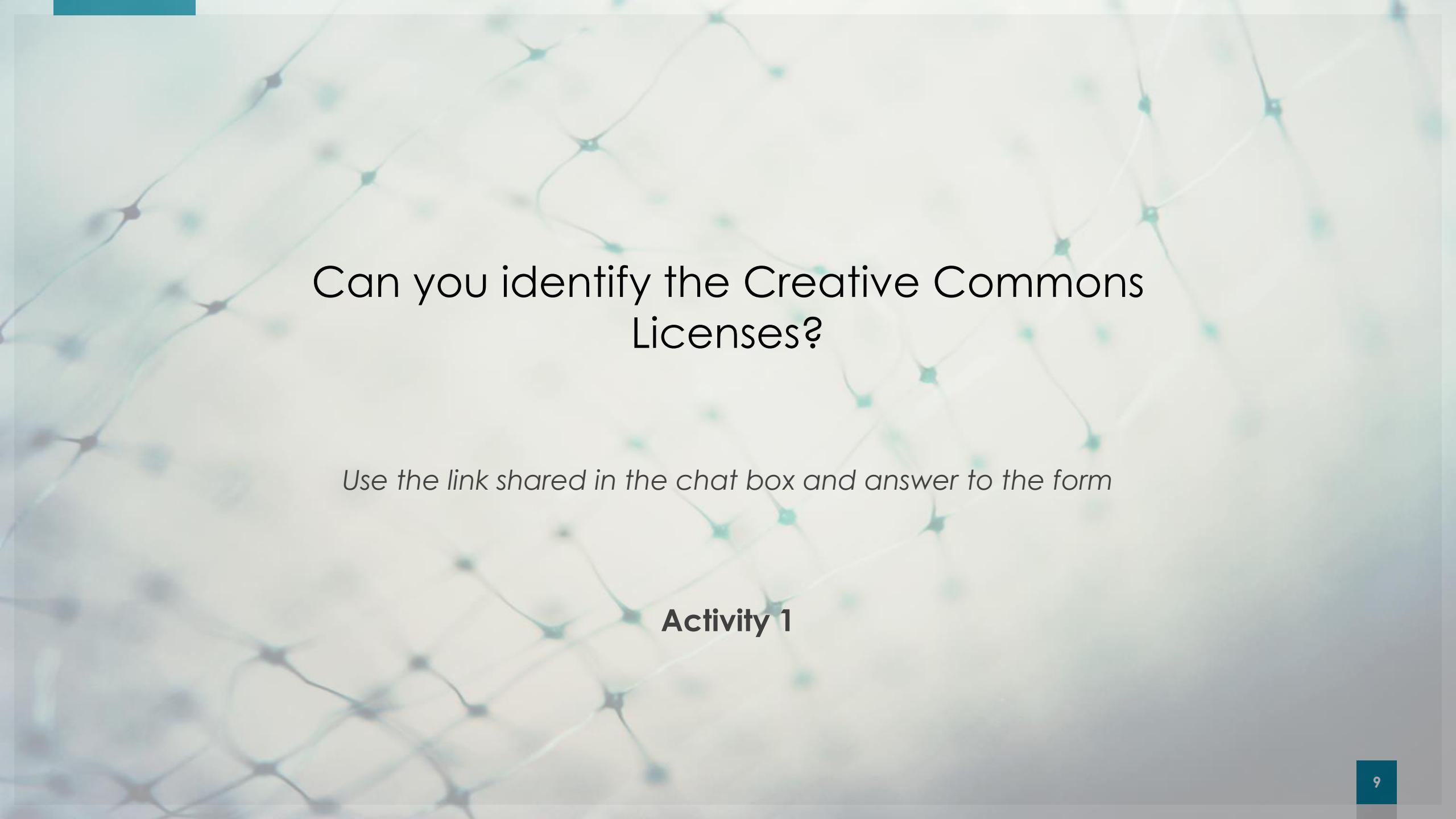


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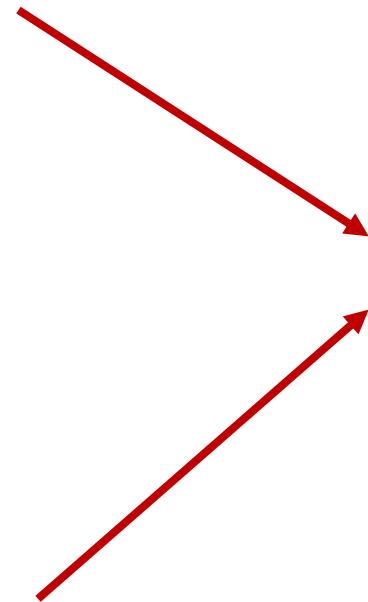
Green



Gold



Hybrid

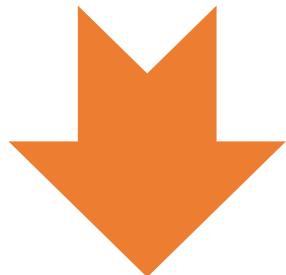


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The Cycle of Scholarly Communication



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Publication Information

Title	ACS Nano [English]
ISSNs	Print: 1936-0851 Electronic: 1936-086X
URL	http://pubs.acs.org/journal/ancac3
Publishers	American Chemical Society [Society Publisher]
TJ Status	Plan S Approved Jisc Approved

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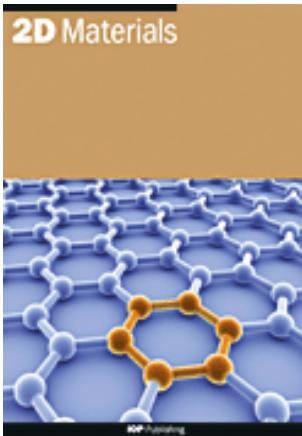


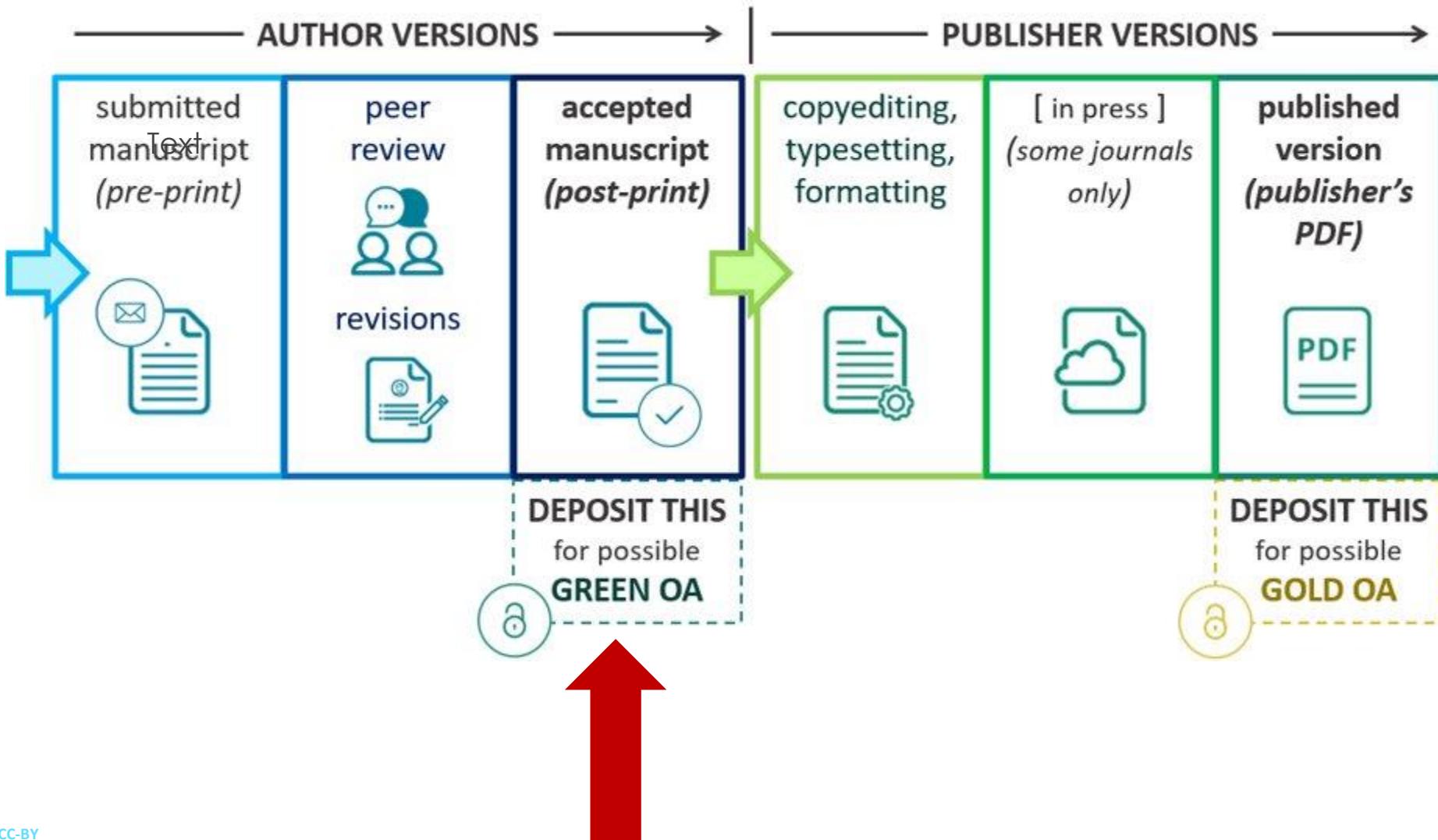
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Materials Science & Engineering A

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Improved plasticity and corrosion behavior in Ti-Zr-Cu-Pd metallic glass with minor additions of Nb: An alloy composition intended for biomedical applications

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ARTICLE INFO

Article history:
Received 11 April 2012
Received in revised form
2 August 2012
Accepted 13 August 2012

Keywords:
Biomaterials
Ti-based bulk glassy alloy
Plastic properties
Plasticity

ABSTRACT

The effects of minor additions of Nb (2.3 and 4 wt%) to the Ti₆₀Zr₂₀Cu₁₀Pd₁₀ alloy are discussed in terms of microstructure, thermal behavior, mechanical properties and corrosion resistance. The addition of Nb promotes the formation of nanocrystals, i.e., from a completely amorphous structure (when no Nb is added) to a mainly crystalline structure (for a 4% of Nb addition). The glassy alloy exhibits large hardness, relatively low Young's modulus and excellent corrosion behavior, although the plasticity is rather limited. A significant increase in compressive strength (total strain over 13%) is achieved in the sample with 3% of Nb without compromising the strength. Young's modulus of the as-cast alloy (around 100 GPa) and measured from tensile measurements) increases only slightly when dispersed nanocrystallites are embedded in the amorphous matrix. Improvement of the corrosion performance, with delayed pitting corrosion, is also observed for 3% Nb addition.

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1. Introduction

Bulk metallic glasses (BMGs) have been widely investigated during the last decade owing to their exceptional mechanical properties, such as high strength, large elasticity and good corrosion resistance. In recent years, the study of BMGs has focused on improving the low plasticity typically encountered in these alloys, to make them suitable materials for structural and engineering applications [1]. Specifically, BMG free from toxic or non-biocompatible elements (e.g., Be, Al, Ni, Co or Cr) have attracted huge interest to be used in the biomedical field since they possess higher strength, lower Young's modulus and often better corrosion and wear resistance than their crystalline counterparts [2]. Among the various compositions of metallic glasses, Ti-based and Zr-based BMG are the most commonly investigated alloys. In particular, Zr-based BMG become attractive to be used in the biomedical field due to their high glass forming ability and large plasticity. However, Zr-based BMG with high glass forming ability and enhanced mechanical properties usually contain toxic elements such as Ni, Be or Al, hence restricting their use in many biomedical applications. Nevertheless, recent studies on Zr-based

BMG containing Al and/or Ni claimed to be non-toxic materials and to exhibit a biocompatibility comparable to that of commercial Ti-6Al-4V alloy [3,4].

Ti-based BMG attract attention as a result of its low density and excellent corrosion and biocompatibility properties. Unfortunately, the plasticity under compression reported for Be-containing Ti-based BMGs [5] cannot be observed in Ti-based BMGs free from toxic elements which hampers their applications as structural components.

Up to now, Ti-6Al-4V alloy remains the most widely used structural metallic biomaterial for the replacement of hard tissues in artificial joints. However, the Ti-22-Zr-Cu-Pd BMG exhibits higher strength (almost twice) and lower Young's modulus than commercial Ti-6Al-4V [6]. Unfortunately, like most metallic glasses, the Ti-Zr-Cu-Pd alloy exhibits low plasticity. This is due to the absence of dislocation activity and the rapid propagation of few shear bands throughout the sample under application of mechanical stress. Several strategies have been pursued to improve the plasticity of this type of alloys. For example, annealing treatments at intermediate temperatures, i.e., between the glass transition temperature (T_g) and the crystallization temperature (T_c), can result in a certain increase of plastic strain [7]. However, different (and sometimes contrasting) effects are often observed after annealing depending on the exact alloy composition and the heat treatment conditions. For example, apart from causing nucleation

SMILL.2013.002856(201302856)

Author Proof

Lithography

Hybrid Helical Magnetic Microbots Obtained by 3D Template-Assisted Electrodeposition

Muhammad A. Zeeshan^a, * Roman Grisch^a, Eva Pellicer^a, Kartik M. Sivaraman^a, Kathrin E. Peyer^a, Jordi Sort^a, Berna Özkal^a, Mahmut S. Sakar^a, Bradley J. Nelson^a, and Salvador Pané^{a*}

The development of micro- and nano-electromechanical systems (MEMS/NEMS) technology has resulted in the fabrication of micro- and nanomachines that can be controlled wirelessly in liquid environments. Among the various actuation and control strategies for these machines, magnetic manipulation has emerged as the most versatile approach, and continuous manipulation of three-dimensional (3-D) micromachines using magnetic field gradients, resonant magnetic fields and rotating magnetic fields has been demonstrated.^[1-9] Rotation is a fundamental motion in biological systems at the micro and nano levels. Rotating motors are responsible for the motion of the bacterial flagella and the ATP synthase molecule. These motors convert rotational motion into translational motion, a strategy that has proven to be effective in the low Reynolds number regime.^[10] Based on this principle, helical micromachines known as artificial bacterial flagella (ABFs) have been wirelessly manipulated in liquid environments using rotating magnetic fields.^[11-14] Potential in vitro applications of these machines have made use of their ability to perform non-contact capture and transport of micro objects. For in vivo applications such as targeted drug delivery applications, it is foreseen that a group of these micro machines could have access to many hard-to-reach locations in the body and maximize drug loading and release. They could navigate through the circulatory, urinary and central nervous systems. The microbots could also be applied in water remediation to patrol stagnant and flowing watersways for effective degradation of organic pollutants. For this application, the microbots should be functionalized with a photocatalytic compound. In any case a swarm control strategy will necessitate the development of reliable processes to fabricate these machines from a combination of materials that enable magnetic control and the incorporation of therapeutic molecules.

In combination with photolithography, electrodeposition has been used to fabricate relatively complex wirelessly controllable 3-D micromachines.^[10] Electrodeposition enables the synthesis of a wide variety of magnetic alloys, and allows the tuning of their properties by modulating factors such as the pH and temperature of the electrolytic bath, additives, and the current density or overpotential of deposition. Electrodeposition also enables the polymerization of a unique class of intrinsically conductive polymers (BCP) on metallic substrates. Among ICP, poly(pyrrole) (PPy) is the most widely studied and characterized due to its excellent biocompatibility, enhanced physical and chemical stability, the tunability to interface towards various cell types, and the ability to incorporate therapeutic molecules into its matrix.^[15-18]

In this paper, we describe a high throughput method to fabricate hybrid artificial bacterial flagella (h-ABFs) consisting of a ferromagnetic metallic tail and a helical polymer tail (see Figure 1(a)). h-ABFs present a number of advantages compared to fully metallic microbots including a lighter weight that reduces sedimentation and facilitates navigation and better biocompatibility because of the replacement of metallic parts with PPy. The h-ABFs were synthesized by template-assisted two-step electrodeposition. The direct line writing (DLW) process provided a simple method to make 3-D photoreactive templates acting as masks during the electrodeposition. With the use of a positive-tone photoresist, it is possible to make 3-D cavities that can be filled by electrodeposition.^[19] The hollow cavities were filled with magnetic cobalt-nickel (CoNi) and biocompatible PPy through electrodeposition. h-ABFs were physically stable in an aqueous environment with a rigid connection between the metallic and polymer segments. The wireless manipulation of these h-ABFs using rotating magnetic fields was demonstrated with a focus on swarm control.

An h-ABF is illustrated in Figure 1(a) and is designed to have a ferromagnetic head for magnetic actuation and a helical tail that provides propulsion in liquid environments. Fig-

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0921-3163/\$ - see front matter © 2012 Published by Elsevier B.V.
<http://dx.doi.org/10.1016/j.msea.2012.08.050>

SMILL.2013.002856(201302856)

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1



Focal release of neurotrophic factors by biodegradable microspheres enhance motor and sensory axonal regeneration *in vitro* and *in vivo*

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*This is an accepted manuscript of an article published by Elsevier in *Brain Research* on 04 February 2016, available online: <http://dx.doi.org/10.1016/j.brainres.2016.01.051>

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This is the accepted version of Huang, M., et al. "Velocity of change in vegetation productivity over northern high latitudes" in *Nature ecology and evolution*, vol. 1 (Nov. 2017), p. 2397-2340X, DOI 10.1038/s41559-017-0328-y. This version is available at <https://ddd.uab.cat/record/181846> under the terms of the All rights reserved license.

1 Velocity of change in vegetation productivity over northern high latitudes

2

3 Mengtian Huang¹, Shilong Piao^{1,2}, Ivan A. Janssens³, Zaichun Zhu¹, Tao Wang², Donghai Wu¹,

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19

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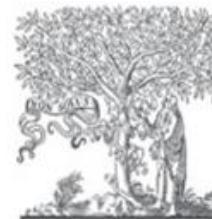
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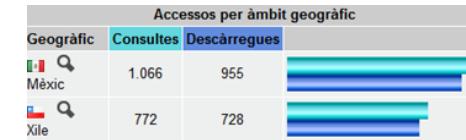

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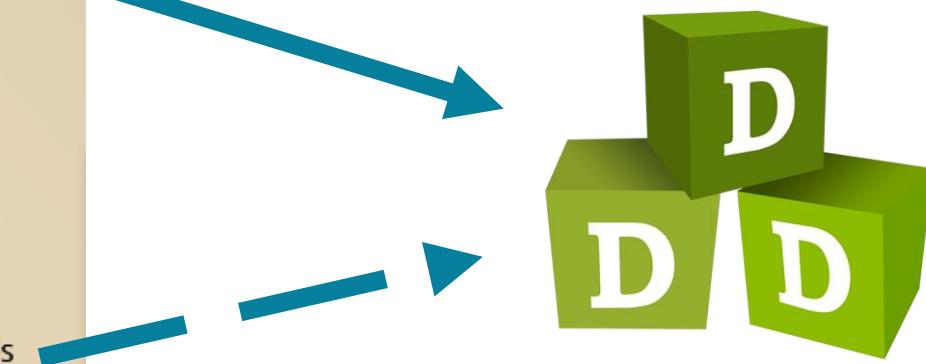
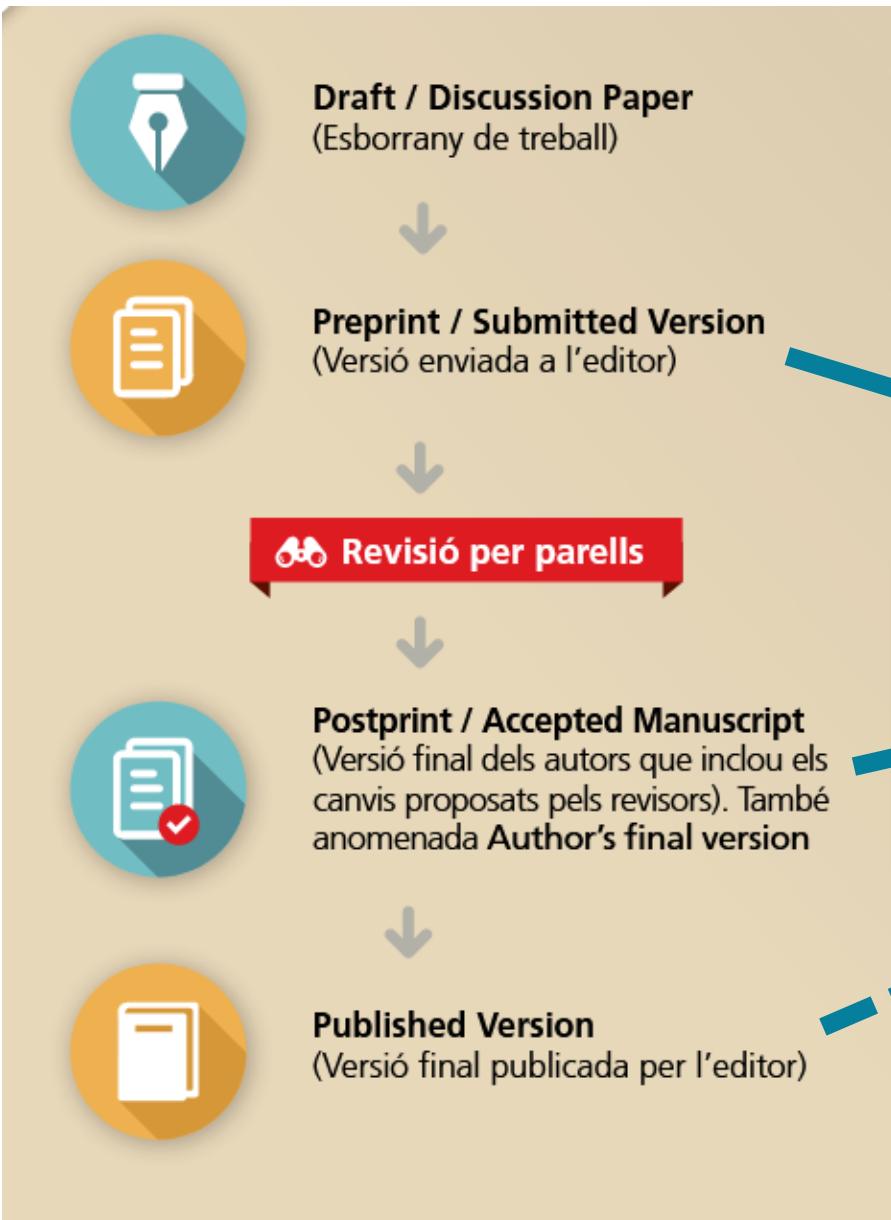
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Novel Ti-Zr-Hf-Fe Nanostructured Alloy for Biomedical Applications

Hynowska, Anna (Universitat Autònoma de Barcelona. Departament de Física)

Blanquer Jerez, Andreu  (Universitat Autònoma de Barcelona. Departament de Biologia Cel·lular, de Fisiologia i d'Immunologia)

Pellicer Vilà, Eva Maria  (Universitat Autònoma de Barcelona. Departament de Física)

Fornell Beringues, Jordina  (Universitat Autònoma de Barcelona. Departament de Física)

Suriñach, Santiago  (Universitat Autònoma de Barcelona. Departament de Física)

Baró, M. D.  (Universitat Autònoma de Barcelona. Departament de Física) [...] [Show all 11 authors](#)

Date: 2013

Abstract: The synthesis and characterization of Ti₄₀Zr₂₀Hf₂₀Fe₂₀ (atom %) alloy, in the form of rods ($\square = 2$ mm), prepared by arc-melting, and subsequent Cu mold suction casting, is presented. The microstructure, mechanical and corrosion properties, as well as in vitro biocompatibility of this alloy, are investigated. This material consists of a mixture of several nanocrystalline phases. It exhibits excellent mechanical behavior, dominated by high strength and relatively low Young's modulus, and also good corrosion resistance, as evidenced by the passive behavior in a wide potential window and the low corrosion current densities values. In terms of biocompatibility, this alloy is not cytotoxic and preosteoblast cells can easily adhere onto its surface and differentiate into osteoblasts.

Grants: European Commission 264635

Ministerio de Ciencia e Innovación MAT2011-27380-C02-01

Ministerio de Ciencia e Innovación TEC2011-29140-C03-03

Agència de Gestió d'Ajuts Universitaris i de Recerca 2009/SGR-282

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Language: Anglès

Document: Article ; recerca ; Versió publicada

Subject: Ti-based alloy ; Biomaterial ; Microstructure ; Mechanical behavior ; Corrosion performance

Published in: Materials, Vol. 6 (2013) , p. 4930-4945, ISSN 1996-1944

DOI: [10.3390/ma6114930](https://doi.org/10.3390/ma6114930)

PMID: 28788368



16 p, 2.7 MB

Label-free and reagentless electrochemical genosensor based on graphene acid for meat adulteration detection

Flauzino, J. M. R. (Institut Català de Nanociència i Nanotecnologia)

Nguyen, Emily P.  (Institut Català de Nanociència i Nanotecnologia)

Yang, Qiuyue  (Institut Català de Nanociència i Nanotecnologia)

Rosati, Giulio  (Institut Català de Nanociència i Nanotecnologia)

Panáček, David (Institut Català de Nanociència i Nanotecnologia)

Brito-Maduro, Ana G. (Federal University of Uberlândia. Institute of Biotechnology (Brazil)) [...] [Show all 10 authors](#)

Date: 2022

Abstract: With the increased demand for beef in emerging markets, the development of quality-control diagnostics that are fast, cheap and easy to handle is essential. Especially where beef must be free from pork residues, due to religious, cultural or allergic reasons, the availability of such diagnostic tools is crucial. In this work, we report a label-free impedimetric genosensor for the sensitive detection of pork residues in meat, by leveraging the biosensing capabilities of graphene acid - a densely and selectively functionalized graphene derivative. A single stranded DNA probe, specific for the pork mitochondrial genome, was immobilized onto carbon screen-printed electrodes modified with graphene acid. It was demonstrated that graphene acid improved the charge transport properties of the electrode, following a simple and rapid electrode modification and detection protocol. Using non-faradaic electrochemical impedance spectroscopy, which does not require any electrochemical indicators or redox pairs, the detection of pork residues in beef was achieved in less than 45 min (including sample preparation), with a limit of detection of 9% w/w pork content in beef samples. Importantly, the sample did not need to be purified or amplified, and the biosensor retained its performance properties unchanged for at least 4 weeks. This set of features places the present pork DNA sensor among the most attractive for further development and commercialization. Furthermore, it paves the way for the development of sensitive and selective point-of-need sensing devices for label-free, fast, simple and reliable monitoring of meat purity.

Grants: European Commission 881603

Agencia Estatal de Investigación SEV-2017-0706

European Commission 683024

Note: Altres ajuts: CERCA Programme/Generalitat de Catalunya

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Language: Anglès

Document: Article ; recerca ; Versió acceptada per publicar

Subject: Food adulteration ; DNA biosensor ; Non-faradaic electrochemical impedance spectroscopy ; Beef ; Pork

Published in: *Biosensors and bioelectronics*, Vol. 195 (January 2022) , art. 113628, ISSN 1873-4235

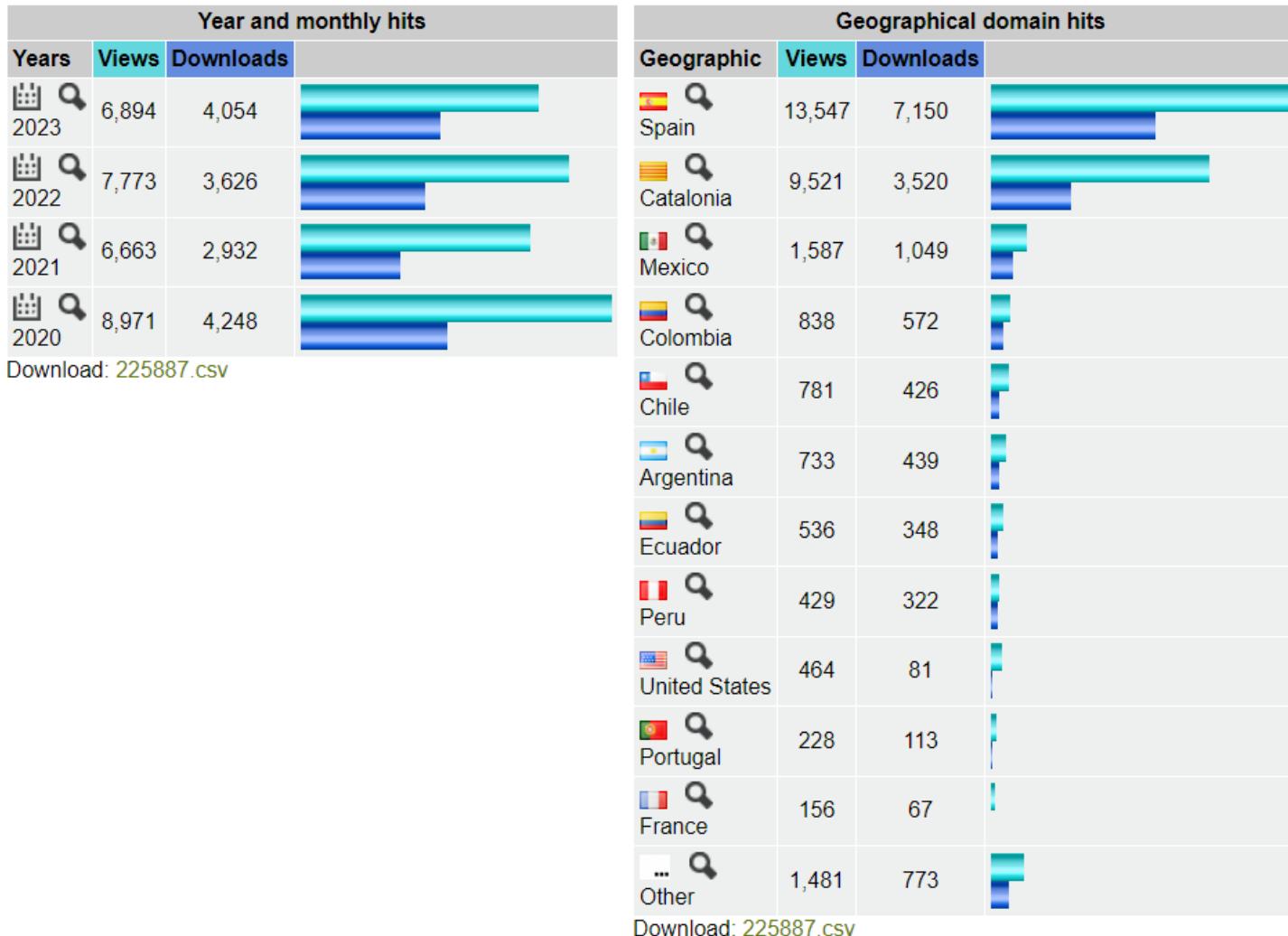
DOI: [10.1016/j.bios.2021.113628](https://doi.org/10.1016/j.bios.2021.113628)

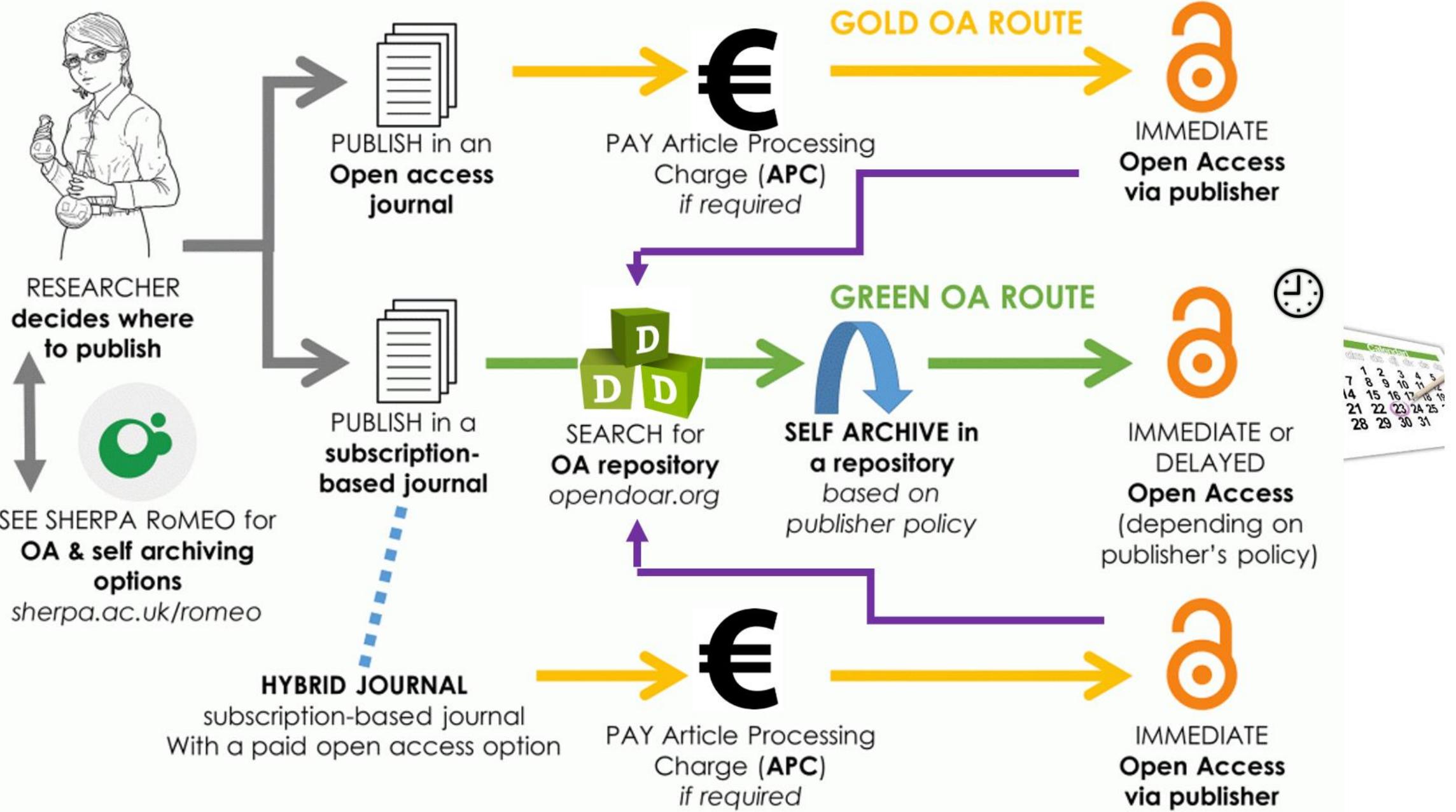


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