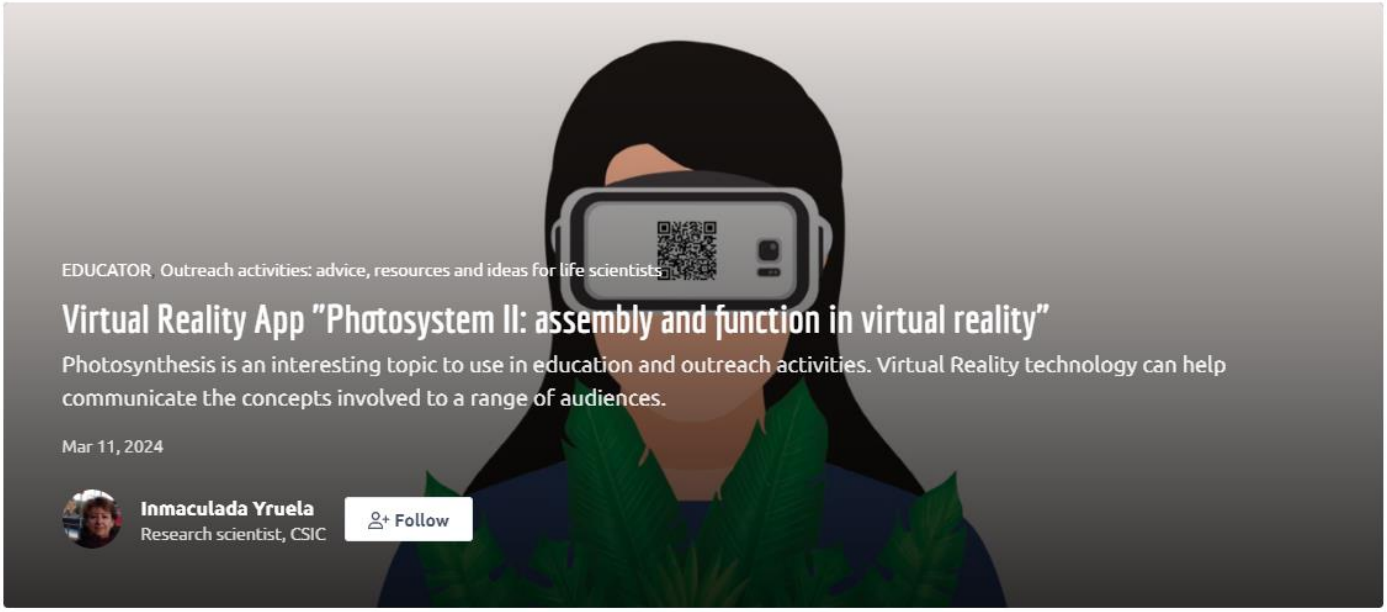

https://network.febs.org/posts/virtual-reality-app-photosystem-ii-assembly-and-function-in-virtual-reality?channel_id=724-educator

The Virtual Reality App "Photosystem II: assembly and function in virtual reality" is an educational tool for teachers, high school students, and first year degree students that invites you to discover, in an informative tone and immersively, where the oxygen we breathe comes from, and makes Earth a habitable planet as we know it. It shows where the first stages of photosynthesis occur inside the plant cells and the activity of the biomolecules involved.

The setting of this story is the chloroplast, an organelle exclusive to plant cells. The main biomolecules involved are chlorophylls, green pigments that give plant leaves their colour, and which are arranged inside complex large proteins that we call photosystems. In particular, we will look at photosystem II (PSII), and we will see how it is assembled from the proteins and pigments that compose it, as well as how it works. The sunlight excites the activity of photosystem II and numerous electrons travel through chlorophylls and other pigments called pheophytins, all of them associated with the photosystem II. These complex reactions are necessary for plant development and growth. Besides, as a by-product, oxygen is released from the photolysis of the surrounding water molecules. The oxygen production reaction requires a lot of activation and needs a catalyst that is part of photosystem II, i.e., the manganese-calcium cluster (Mn_4CaO_5), which is ligated to this large protein-pigment complex. Molecular oxygen is released into the atmosphere and is the one we continuously breathe.

We encourage you to discover the first stages of photosynthesis with this App in Virtual Reality! You can download the Virtual Reality App here and we encourage you to read this other post from the author describing the past, present and future research on photosynthesis, from discovering the water-splitting reaction to creating devices that could carry out artificial photosytheis, and hence provide oxygen to support space exploration.

App's technical description:

- Three executable files for Virtual Reality App in Android devices or Smartphones (Versions in Spanish, English and French © CSIC – FESD, 2019).
- Mobile device or smartphone with Android as mobile operating system (medium - high quality) Octa-Core 2.2 Ghz 6Gb RAM, gyroscope and accelerometer.

Students using the Virtual Reality App "Photosystem II: assembly and function in virtual reality".

Flyer for the Virtual Reality app download, with QR code and sponsors' logos.

Images from Inmaculada Yruela.

Inmaculada Yruela(She/Her)

Research scientist, CSIC

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Dr. Inmaculada Yruela graduated and earned her doctorate in Chemistry at the University of Sevilla (Spain). She has been a visiting guest scientist at the Max Planck Institute for Chemical Energy Conversion in Mülheim an der Ruhr (Germany) and at Department of Biochemistry and Molecular Biology in Indiana University School of Medicine (USA). She is research scientist at the CSIC and group leader at Computational and Structural Biology in Estación Experimental de Aula (CSIC), Zaragoza (Spain). From the early 1990s she has been studying the relationship between the structure and function of redox protein complexes involved in photosynthesis (I.e. PSII, cytochromes) among other, and more recently the role of intrinsic ductiliity and plasticity of proteins in organismal complexity, multicellularity and evolution. She has led science outreach projects. She is currently member of SEBBM.