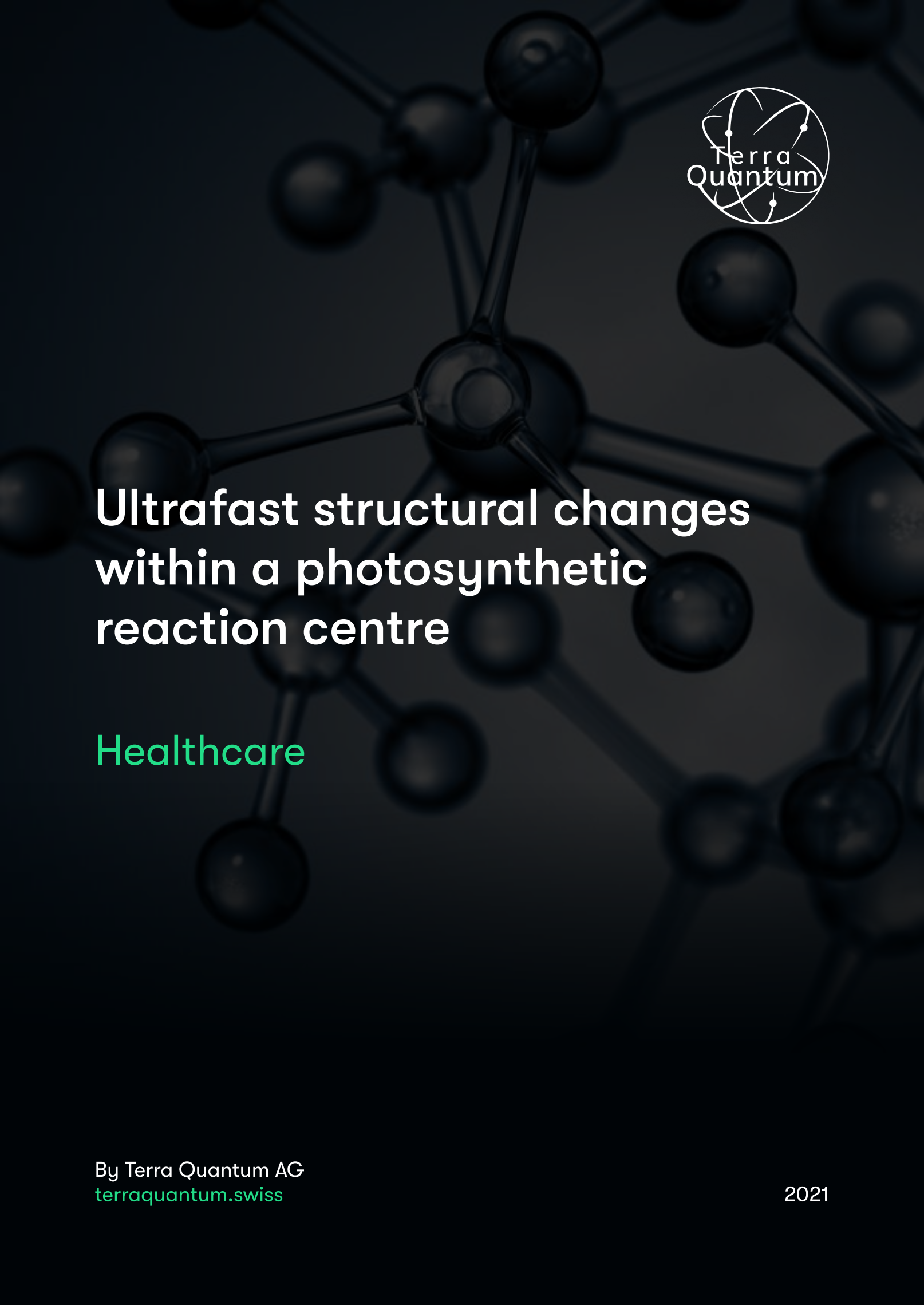

Ultrafast structural changes within a photosynthetic reaction centre

Healthcare

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Ultrafast structural changes within a photosynthetic reaction centre

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ABSTRACT

Photosynthetic reaction centres harvest the energy content of sunlight by transporting electrons across an energy-transducing biological membrane. Here we use time-resolved serial femtosecond crystallography1 using an X-ray free-electron laser2 to observe light-induced structural changes in the photosynthetic reaction centre of Blastochloris viridis on a timescale of picoseconds. Structural perturbations first occur at the special pair of chlorophyll molecules of the photosynthetic reaction centre that are photo-oxidized by light. Electron transfer to the menaquinone acceptor on the opposite side of the membrane induces a movement of this cofactor together with lower amplitude protein rearrangements. These observations reveal how proteins use conformational dynamics to stabilize the charge-separation steps of electron-transfer reactions.

The full article can be found here:
https://www.nature.com/articles/s41586-020-3000-7