# Study and evaluation of EPFL_JPEG_DNA codec

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## 1 Objetives

Recently, the JPEG DNA research group started an exploration on the opportunity to develop a specific image coding solution adapted to the technologies of DNA synthesis to compress and store images into DNA-like sequences [1]. Some compression algorithm and coders have been developed specifically for this paradigm of data storage [2], [3], [4]. Two codecs were proposed, one by the I3S Laboratory (HiDNA) and the other by the EPFL university (EPFL_JPEG_DNA). This work will consider the study and evaluation of the **EPFL_JPEG_DNA** codec.

## 2 Tasks

**Task 1** Study previous bibliography.

**Task 2** Study and test the EPFL_JPEG_DNA codec.

**Task 3** Compare with the JPEG DNA proposed anchors.

**Task 4** Results analysis.

**Task 5** Report writing.

## 3 References

- M. Dimopoulou, M. Antonini, P. Barbry, and R. Appuswamy, "A biologically constrained encoding solution for long-term storage of images onto synthetic DNA," EUSIPCO, 2019.
- C. Pan, S. M. Hossein Tabatabaei Yazdi, S. Kasra Tabatabaei, A. G. Hernandez, C. Schroeder, and O. Milenkovic, "Image processing in dna," in ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2020, pp. 8831–8835.

- M. Antonini, L. Cruz, E. Da Silva, D. Melpomeni, T. Ebrahimi, S. Foessel, E. Gil, S. Antonio, G. Menegaz, F. Pereira, X. Pic, A. Pinheiro, and M. Raad, "DNA-based Media Storage: State- of-the-Art, Challenges, Use Cases and Requirements," Oct. 2021, working document of the JPEG DNA AHG. [Online]. Available: https://hal.archives-ouvertes.fr/hal-03447138

- N. Goldman, P. Bertone, S. Chen, C. Dessimoz, E. M. LeProust, B. Sipos, and E. Birney, "Towards practical, high-capacity, low- maintenance information storage in synthesized DNA," Nature, vol. 494, no. 7435, p. 77, 2013.