UNIÓN EUROPEA
Fondos Estructurales
Invertimos en su futuro

PROYECTOS SINÉRGICOS 2018 EN I+D

ACRONIMO: Y2018/BIO-4747

TITULO PROYECTO: Nanobiotecnología Estructural y Molecular de Procesos de Reparación de ADN relacionados con Cáncer

PRESUPUESTO CONCEDIDO: 812.900 €

(413.200 € -- CNB, 381.700 € – CNIO)

NanoBioCancer

www.nanobiocancer.com

Madrid, 1 de febrero de 2023

Y2018/BIO-4747 - ¿Quiénes participamos?

Coordinator

Fernando MORENO-HERRERO
CNB-CSIC, Madrid, Spain

Single molecule Biophysics
Atomic Force Microscopy
Optical / Magnetic tweezers

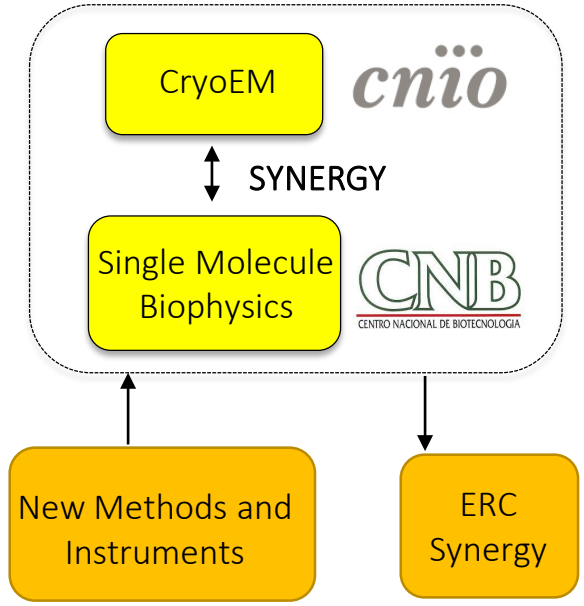
Oscar LLORCA
CNIO, Madrid, Spain

Cryo-Electron Microscopy
Structural Biology

A new consortium

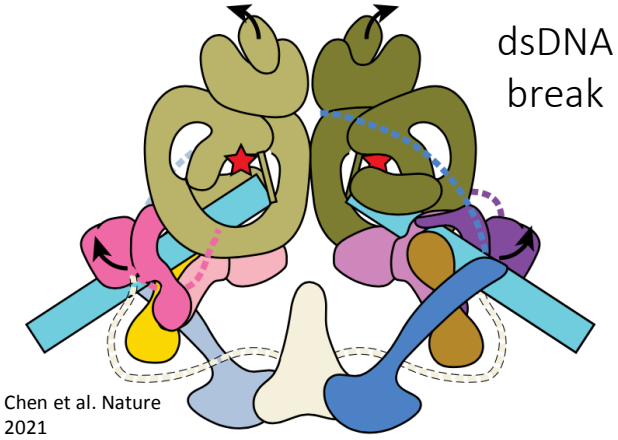
NanoBioCancer

Resolve complex biological questions in Cancer involving protein complexes and nucleic acids (DNA / RNA)

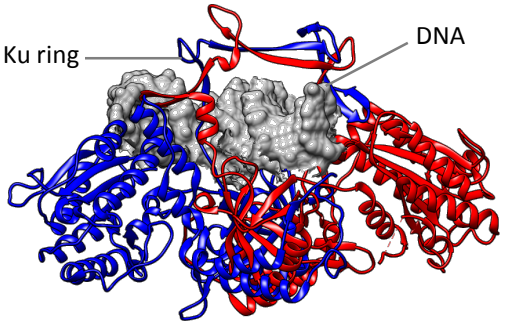


Y2018/BIO-4747 - ¿Qué objetivos planteamos?

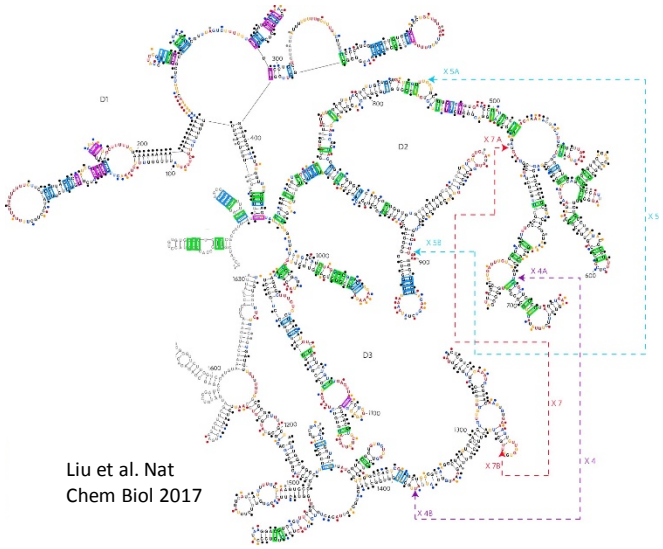
Non-homologous End-Joining (NHEJ)



Chen et al. Nature 2021



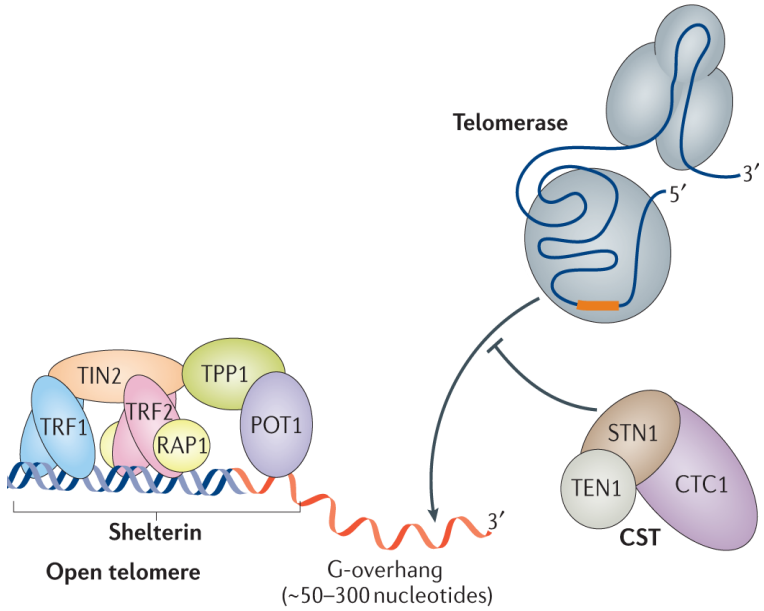
Ku70-Ku80 (Ku heterodimer)



Liu et al. Nat Chem Biol 2017

Long non-coding RNAs (lncRNAs)

Telomere maintenance / CST complex

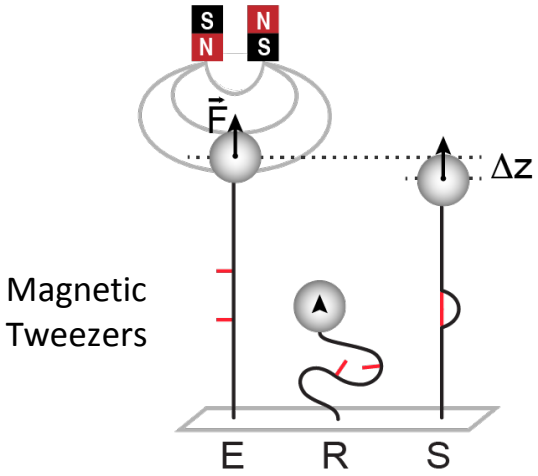


Lim et al. Nat Rev Mol Cell 2021

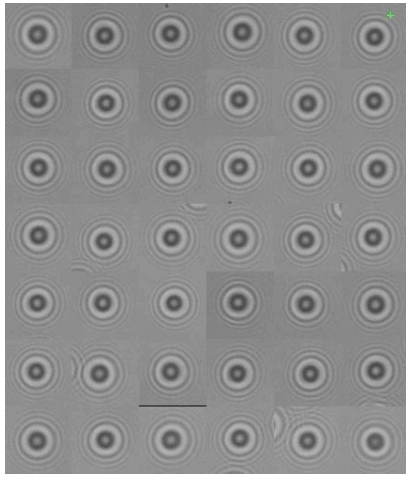
Y2018/BIO-4747 - ¿Qué resultados hemos obtenido?

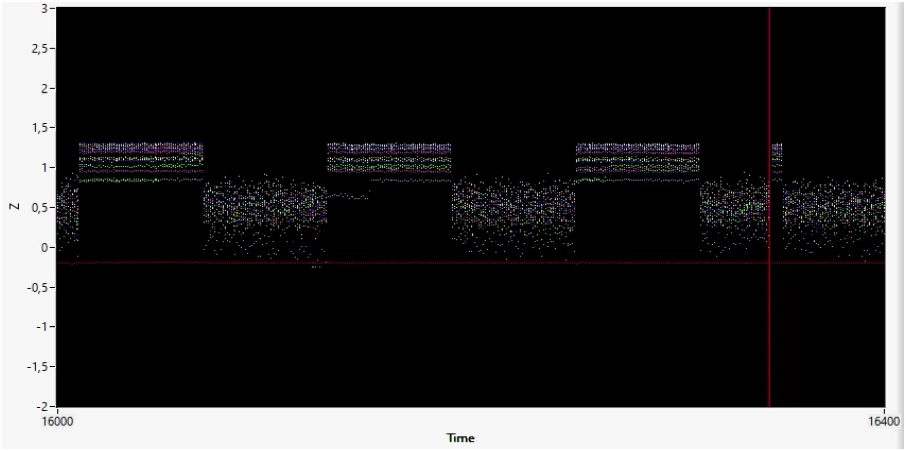
METHODS DEVELOPMENT

Mimicking a double-strand DNA break to study the DNA repair pathways

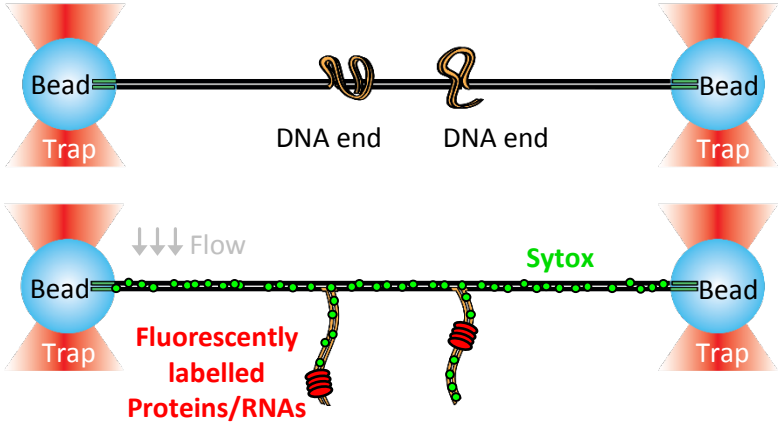


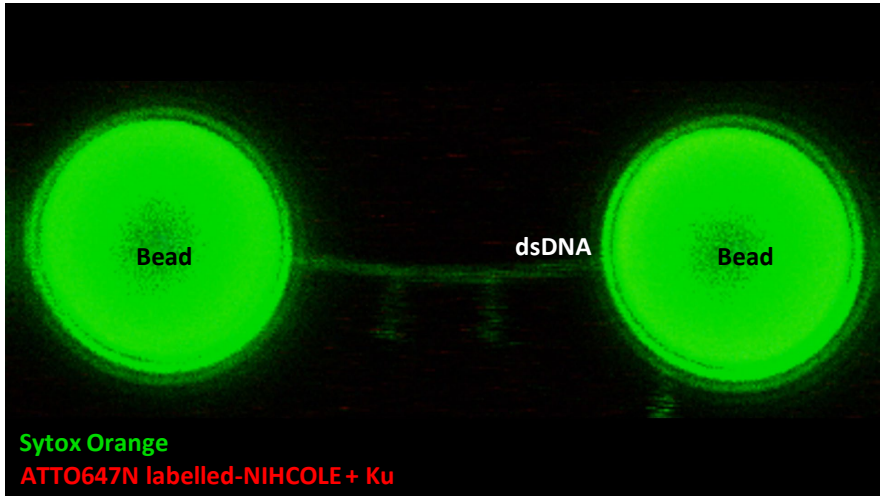
Magnetic Tweezers





Direct visualization of the interaction of proteins and RNAs with dsDNA ends



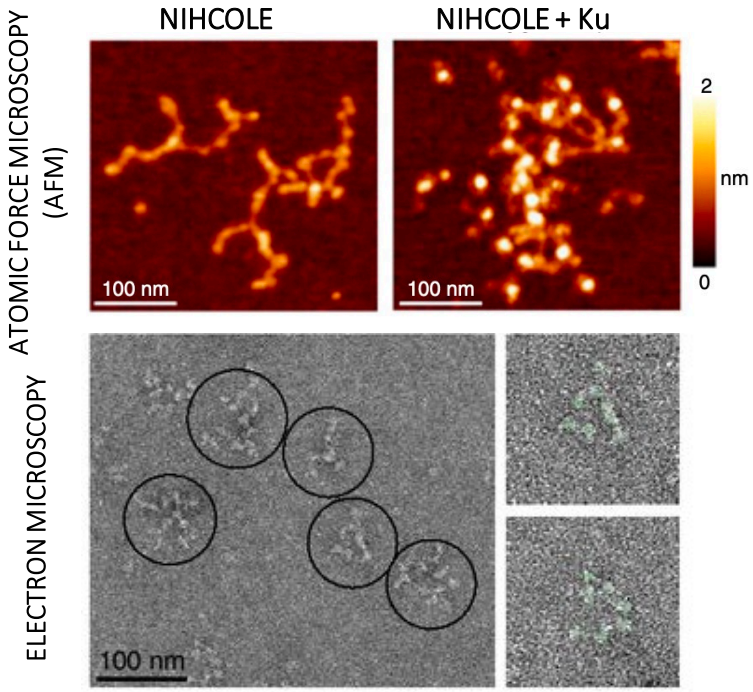


Unpublished data

Y2018/BIO-4747 - ¿Qué resultados hemos obtenido?

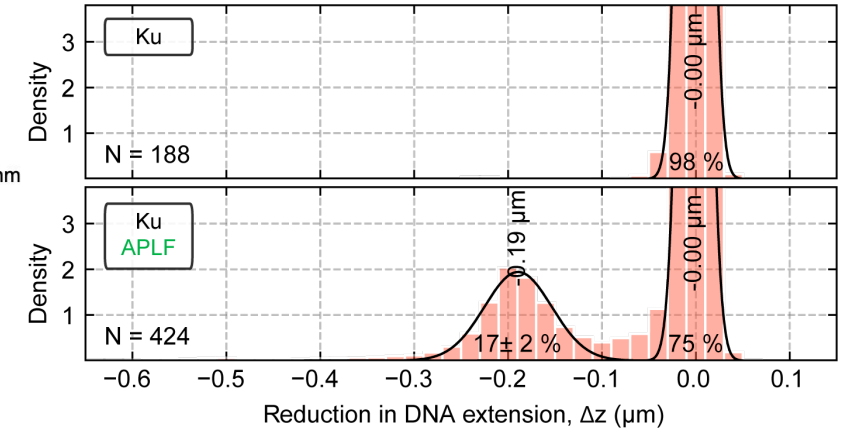
lncRNA NIHCOLE

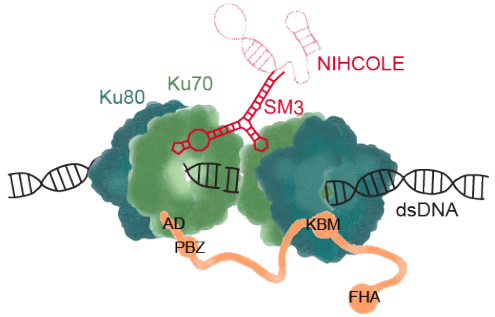
- Upregulated in Hepatocellular carcinoma
- Decreased survival, aggressive tumors
- Confers advantage to HCC cells.



APLF, Ku and NIHCOLE in NHEJ

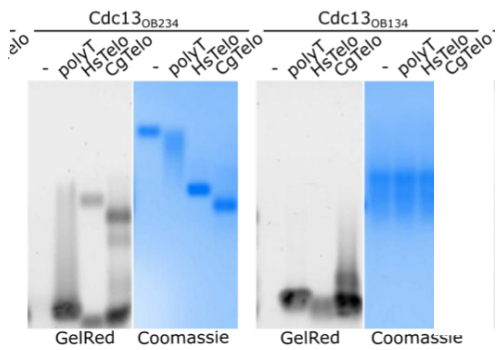
- In NHEJ, the Ku-APLF complex supports DNA end synapsis for several minutes under piconewton forces
- lncRNA NIHCOLE fortifies the DNA synapsis

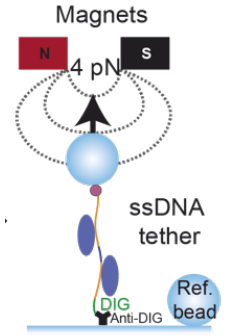


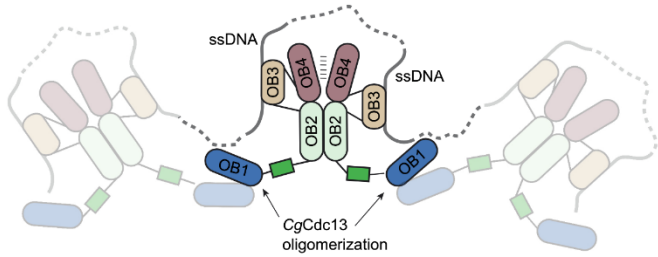


Cdc13 in telomere maintenance

- Cdc13 interaction with ssDNA
- Molecular structure and function of Cdc13







Unfried et al. **Cancer Research 2021**

De Bragança et al **Cell reports 2023**

Coloma et al **Nucleic Acids. Res. 2023**

"la Caixa" Foundation

Health Research Call 2021

LncRNAs in DNA replication and colon cancer

995.200 € Maite Huarte (CIMA – U. Navarra)

erc European Research Council Established by the European Commission

Synergy Grants Antonin MORILLON (Curie-CNRS)

Janusz BUJNICKI (IIMCB)

Calls 2019, 2021 – Step 3 Interview

New call 2022 - pending

Y2018/BIO-4747– ¿Cómo hemos continuado?

NanoBioCancer

This was a new consortium in 2019
Now – consolidated and great future ahead!!

LncRNA rules

erc
European Research Council
Established by the European Commission
Synergy Grants

LncRNAs in colon cancer

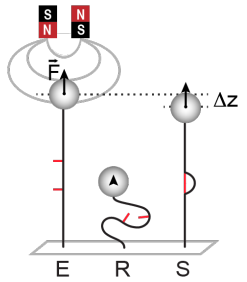
"la Caixa" Foundation

Maite Huarte
CIMA – Univ de Navarra

LncRNAs in hepatocelullar carcinoma

Puri Fortes
CIMA – Univ de Navarra

Non Homologous End-Joining (NHEJ)



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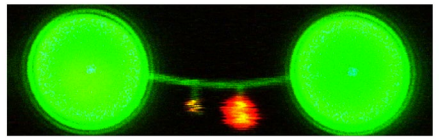
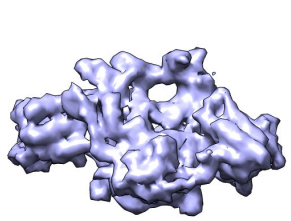
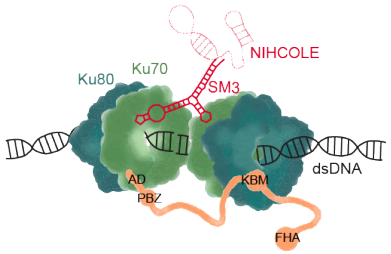


C-trap



CryoEM



Human CST and telomeres