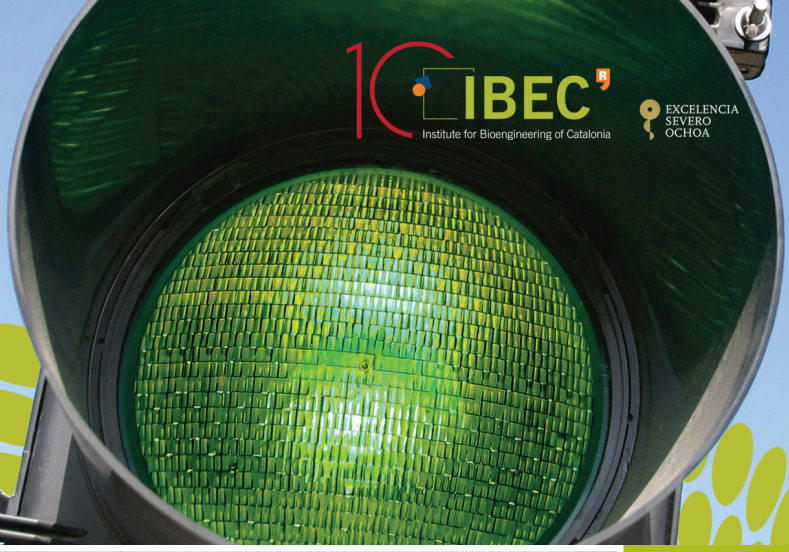
IBEC International PhD Programme Fellowships



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Nanobioengineering group

Group leader: Josep Samitier

Using functional cell-based assays to improve pediatric cancer treatment

One of the main problems in medical oncology is to assign the right treatment to every cancer patient, but the tumors' plasticity complicate these assignments. I developed a functional assay called dynamic BH3 profiling or DBP that allows the rapid evaluation of treatments directly on patient-isolated cells and determine if they will or will not be effective to eradicate a tumor (Fig. 1A). The goal of this translational PhD thesis is to combine analyses of cancer cells with DBP data to better understand what are the main signalling pathways ensuring pediatric tumors' survival. This information will allow to find better treatments against these tumors and test them. Moreover, the student will help to understand how certain tumors can survive treatment, and find better ways to eliminate them. Our aim will be to truly help pediatric oncologists at Hospital Sant Joan de Déu to find better treatments for their patients (Fig. 1B).

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For more information:

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Montero J, Letai A. Why do BCL-2 inhibitors work and where should we use them in the clinic? Cell Death and Differentiation. *Oct 2017.*

Montero J, Stephansky J*, Cai T, Griffin GK, Cabal-Hierro L, Togami K, Hogdal LJ, Galinsky I, Morgan EA, Aster JC, Davids MS, LeBoeuf NR, Stone RM, Konopleva M, Pemmaraju N, Letai A, Lane AA. Blastic plasmacytoid dendritic cell neoplasm is dependent on BCL-2 and sensitive to venetoclax.* Cancer Discovery. *Feb 2017.*

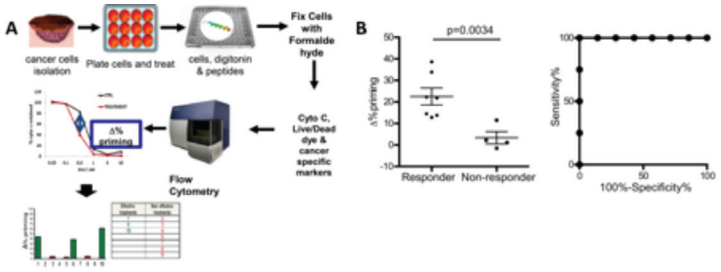

Figure 1. Dynamic BH3 profiling (DBP), a novel predictive biomarker for chemotherapy response (A) Graphical representation of dynamic BH3 profiling or DBP (Montero et al., Cell *2017). By comparing the non-treated cells with the treated ones, it will determine the Δ%priming for each agent and identify which are most effective to induce apoptosis in that specific tumor. This analysis is performed in less than 24 hr, minimizing* ex vivo *culture. (B) DBP can also predict what patients will respond to therapy and those that will not, helping oncologist making clinical decisions. Δ% priming in 26-hr vehicle and MDM2 inhibitor CGM097-treated groups in 11 B-ALL PDXs. Receiver-operating characteristic curve analysis, AUC ROC =1, showing perfect prediction.*