

# BIOPHYSICS COLLABORATION

## Requests to the Project and Accelerator divisions

### 1. Engineering run at the end of 2023

- Within the engineering run, accelerator crew is planning a test of the He/C mix that we want to use in experiment B-22-0085 selected by the Bio-PAC under the condition that the accelerator could deliver the mixed beam
- Biophysics will need high-intensity ( $>10^{10}$  pps) of  $^{12}\text{C}$ -ions for BARB and FLASH “flagship” experiments, this should be tested in the engineering run

### 2. 2024 run

- Biophysics has 10 experiments rated A by the Bio-PAC (23 shifts,  $^{12}\text{C}$ -ions  $\sim 200$  MeV/n) and 8 experiments from the ESA-PAC selection (20 shifts,  $^{56}\text{Fe}$ -ions 1 GeV/n). In addition, we have 18 shifts for the ERC AdG BARB and approximately 15 of shifts on EU, ESA and NIH projects (contracts signed).
- Bio-PAC, ESA-PAC, and BARB blocks should be assigned in different times with some weeks break and all shifts split in the 2 years of equal length
- As noted above, high-intensity is critical for the scientific success
- Support of the specialized groups from the Commons subprojects is mandatory

### 3. FAIR 2028

- Biophysics aims at using HEB (or ring branch) and CBM caves in 2028 for programs in therapy and space radiation, respectively
- RIB experiment in HEB (ERC POC EXONERATE, successor of BARB; and new proposals for exotic beams from other members of the collaboration) can be tested in Early Science (needs  $^{12}\text{C}$  or  $^{16}\text{O}$  primary beams at  $\sim 10^{10}$  pps,  $\sim 200$  MeV/n, use secondary beams of  $^{10}\text{C}$ ,  $^{11}\text{C}$ ,  $^{14}\text{O}$ ,  $^{15}\text{O}$  on target)
- Galactic cosmic ray simulator (GCRsim) funded by ESA and tested in Cave A during FAIR-phase-0 will be moved to CBM cave for test in FS+
- GCRsim needs  $^{56}\text{Fe}$ -ions at 10 GeV/n,  $\sim 10^7$  pps
- This will be a worldwide energy record for ground-based GCRsim (NASA GCRsim at the Brookhaven National Laboratory has a cutoff at 1 GeV/n).