



**International Bio-PIN pilot**  
(based on SNPs and STRs)

The pilot study comprises the production of a PIN code for biobanking. Since that code is based on biological characteristics which can uniquely distinguish individuals, it is called "Bio-PIN".

The Bio-PIN will be produced in 3 different ways and together with all the procedures, the results will be compared and evaluated for distinguishing power, accuracy, time and costs required for the production and the sustainability of the end-product.

The pilot study involves 10 institutes, which each will provide 10 anonymous blood samples of 4 dried blood spots on filter paper cards to produce a Bio-PIN in 3 different ways for each of the samples.

As depicted in the diagram, the following steps will be taken in the pilot:

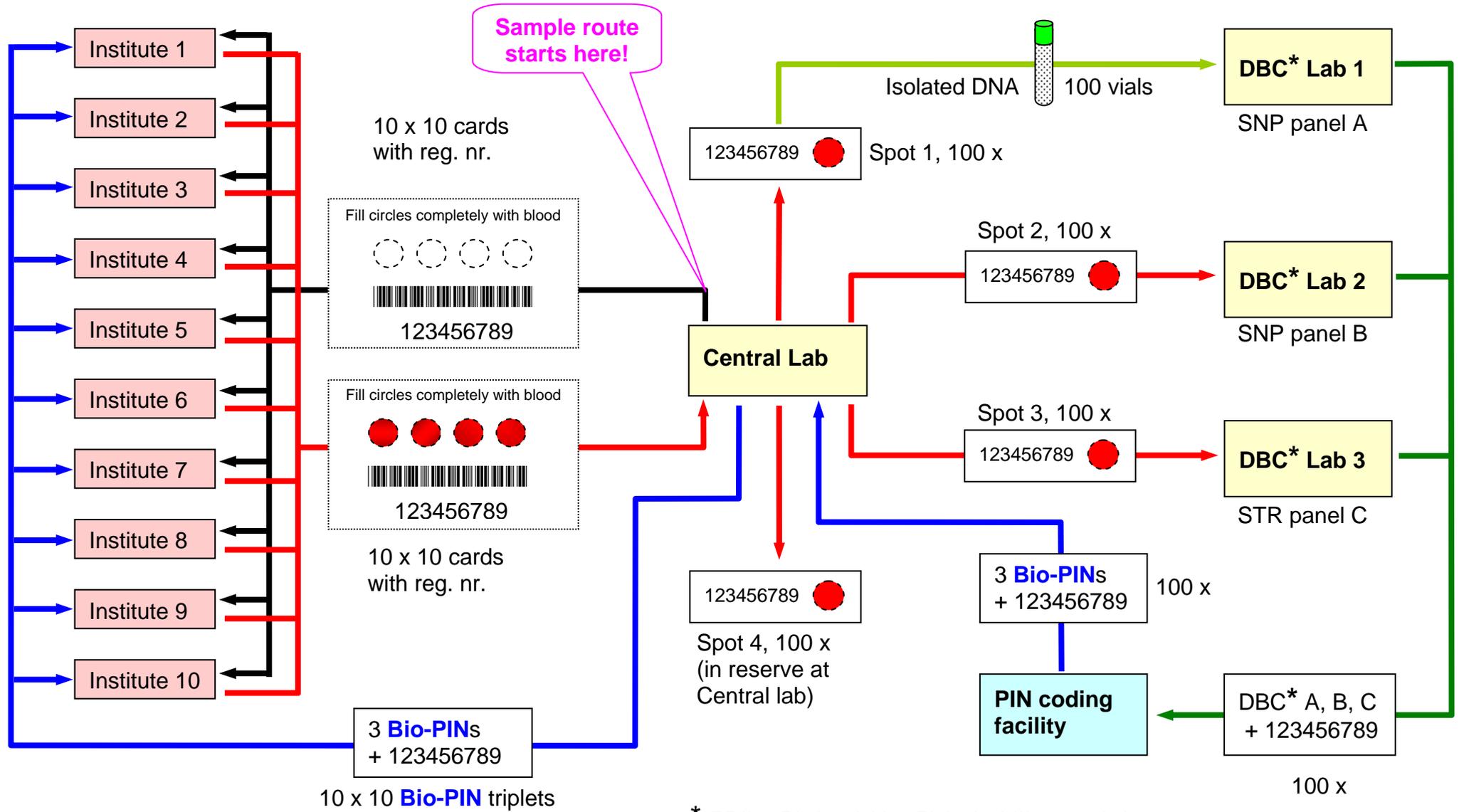
- From the central laboratory sets of 10 cards, each carrying a different administration number (which is also depicted as a bar code), will be sent to each of the 10 institutes, after the central lab has registered which cards go to which institute.
- At the institutes, on each card 4 spots (of 75  $\mu$ l) of the blood of a single individual will be deposited and dried.
- The filter cards with the dried blood spots are then sent back to the central laboratory, where they are cut in sections each with a single blood spot.
- Of the 4 sections of each card 1 is used for DNA isolation in the central laboratory.
- The isolated DNA is sent to a lab for determination of a SNP panel.
- Per card, 2 other sections will be sent to other labs for the determination of another SNP-panel, respectively a DNA fingerprint based on STRs, whereas the 4<sup>th</sup> section will be kept in reserve at the central lab.
- The 2 SNP-panels and the DNA fingerprint data are used as 3 uniquely distinguish biological characteristics (DBC's) of the sample that is involved, while the DNA fingerprint will also be used to compare the capacity to uniquely distinguish the individual who provided the sample from other individuals with that capacity of each of the 2 SNP-panels.
- Each of the 3 DBC's per sample is used for the production of a **Bio-PIN** in the PIN coding facility.
- The triplets of **Bio-PIN**s are then sent to the central laboratory, which sends the triplets to the right institutes, based on the administration numbers which have accompanied the samples, the DBC's and the **Bio-PIN**s all the way through the pilot.
- The chains of events/determinations leading to the 3 **Bio-PIN**s for each of the 10 sets of 10 samples are evaluated as described above and compared.

Different samples from the same individual should result in identical DBC's for the DNA fingerprints as well as for the 2 SNP panels. Consequently identical DBC's should consequently lead to identical **Bio-PIN**s. In order to establish whether that is indeed the case for all three types of DBC's, the 10 institutes should send a certain number of samples in duplo within their set of 10, but not reveal how many duplo's they provided, till they received the **Bio-PIN**s produced for the samples they provided.

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\* DBC = Distinguishing Biological Characteristic.