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Production of Classical and Theranostics Radionuclides

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Trend of producing radionuclides for medical applications for both diagnostic and therapeutic purposes is on the rise. Amongst all medical radioisotopes, Mo-99/Tc-99m is the power hub of all nuclear medicines as it is being used in 80% of the nuclear procedures worldwide. I have been involved in production of Mo-99/Tc-99m Generators for the last twelve years in Pakistan. My institute is providing radioisotopes (Mo-99/Tc-99m generators, I-131, Lu-177 etc.) across all the country and fulfilling the national demands. However due to the shortage of nuclear reactors worldwide (shut down of major reactors after finishing life), shortage of Tc-99m is foreseen in near future. As an alternative of reactor produced classical isotopes, researchers are looking for alternatives. Recently MEDICIS, CERN (a new facility) has started to produce non-conventional / exotic medical radioisotopes, which would eventually be used as diagnostic, therapeutic and theranostics pairs.

Radiochemistry is extremely important for the removal of impurities, which may implant on the foils along with the required isotope. A method for the separation of lanthanides has been developed and tested at MEDICS and will be performed for the radionuclidic purification in future isotope implantations. Column chromatography will be carried out by using strong macroporous cation exchange resin for separating the lanthanides.

Purified Radioisotopes will be shipped to the partner institutes / hospitals for labelling it with some chemical compounds for further research and development.

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