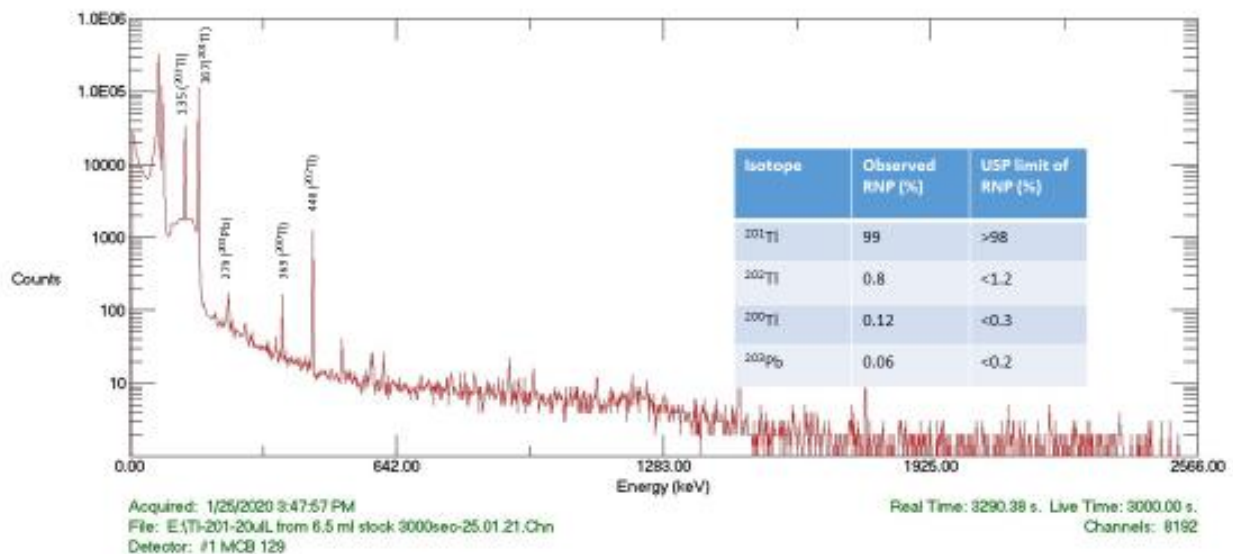


## Production of Tl-201 in MCP, Chakgaria

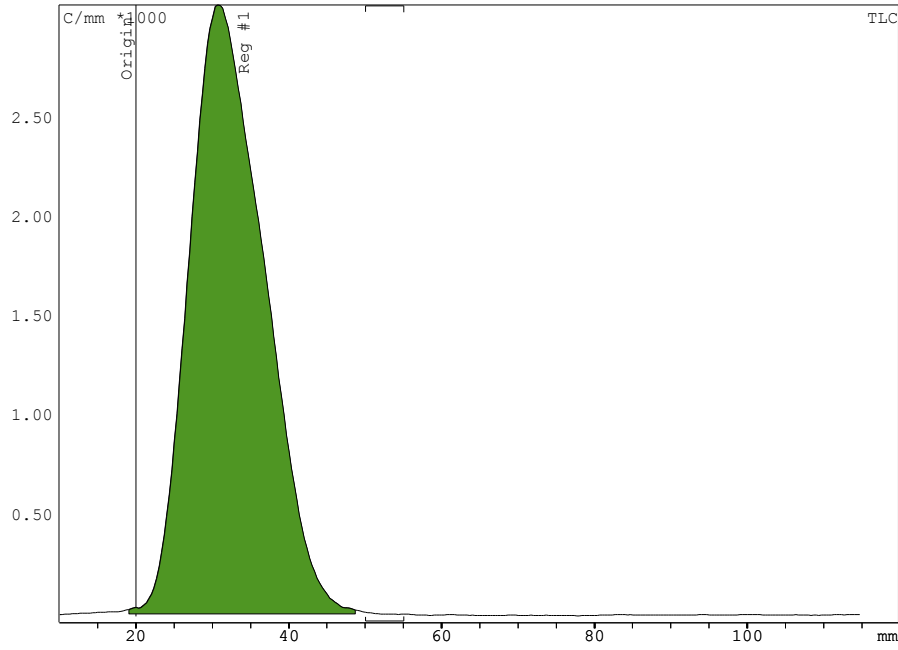
Thallium-201 is a potentially useful radioisotope for a variety of medical applications including a functional assessment of the myocardium which in turn allows an assessment of the extent of damage after a heart attack or from chronic heart disease and possible assessment of physiology, as a renal medullary imaging agent, and for tumor detection. At present [<sup>201</sup>Tl] Thallous chloride radiopharmaceutical is procured from abroad costing USD 600 per patient dose (2-3 mCi).

BRIT, Kolkata jointly with VECC, Kolkata has successfully achieved to produce Tl-201 (half life: 73 h) on 21.01.2021 from enriched Tl-203 electroplated target (97%) irradiated with 28 MeV proton of 57 μAh integrated beam current (Nuclear reaction <sup>203</sup>Tl(p,3n) <sup>201</sup>Pb (decays in 34 hour) <sup>201</sup>Tl). At first chemical separation of Pb-201 from Tl-203 was done within one hour after end of bombardment (EOB). Then after 34 hours of decay of Pb-201 to Tl-201, second and the final separation was carried out and formulation of [<sup>201</sup>Tl] Thallous chloride radiopharmaceutical was done. It is a first time production in India. Total 30 mCi (10 patient dose) of [<sup>201</sup>Tl] Thallous chloride have been produced in 1.5-hour irradiation which will be around 750 mCi (150 patient dose) for 9 hours irradiation of 150 μA proton beam current in full capacity of production.

The Thallium-201 chloride was evaluated by performing physico-chemical test such as Radionuclidic purity (RNP) and Radiochemical purity (RCP) determination. The R.N. Purity of <sup>201</sup>Tl-chloride was found to be >99%. The R.C. Purity of <sup>201</sup>TlCl was 100%.



**Gamma Spectra of [<sup>201</sup>Tl]Thallous Chloride**



**Radio-TLC for RC Purity of [<sup>201</sup>Tl] Thallous chloride**

