

Separation of metal radionuclides

<https://www.iocbtech.cz/project/separation-of-radionuclides-2/>

CHALLENGE

Purification of metal radionuclides for medical applications

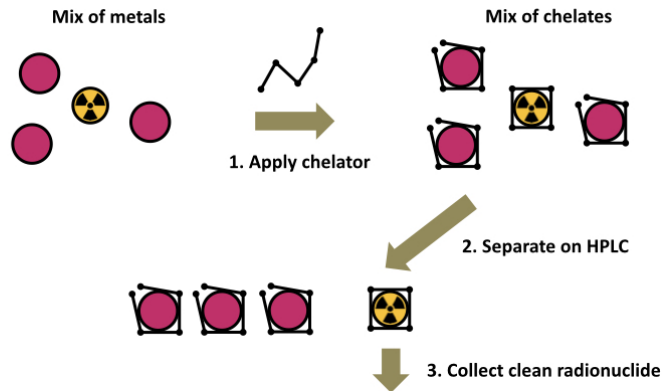
Problem: Metal radionuclides are increasingly used for diagnosis and therapy of cancer. For medical applications, the radionuclides must be of extremely high purity. Contamination with other metals compromises the therapeutic efficiency.

TECHNOLOGY

Our solution: We developed a new class of organic molecules (chelators) that greatly simplify purification of metal radionuclides. We let the molecules do the hard work.

1. The chelator wraps around the metal to form a complex. Thanks to this molecular coat, the metal behaves as an organic molecule.
2. The chelator is carefully tailored to fit the metal radionuclide. It does not fit well other metals, even if they are chemically similar. The metal complexes behave as different organic molecules.
3. The complex of the radionuclide is easily separated by high-performance liquid chromatography (HPLC).
4. The metal radionuclide is released from the complex with mild acid. Chelator is removed by solid-phase extraction.

Quick overview of the technology



Advantages

- Technology compatible with conventional HPLC systems.
- Green chemistry – no toxic chemicals.
- All procedures can be automated.
- Fast separation process (< 10 min).
- No need to use solvents additives.
- Extremely similar metals can be separated (e.g. lanthanides).

COMMERCIAL OPPORTUNITY

This technology was successfully licensed to [SHINE](#).

The press release can be found [here](#).

DEVELOPMENT STATUS

proof of concept

PATENT SITUATION

European patent application with priority date in 2017.

IP OWNERS

- Institute of Organic Chemistry and Biochemistry AS CR, v.v.i.

FURTHER READING