

## 89ZR-OXINE COMPLEX FOR IN VIVO PET IMAGING OF LABELLED CELLS AND ASSOCIATED METHODS

### SUMMARY

The National Cancer Institute seek parties interested in in-licensing and/or collaborative research to develop and commercialize cell labeling, cell tracking, cell trafficking, cell-based therapy, and PET imaging for cancer.

### REFERENCE NUMBER

E-080-2014

### PRODUCT TYPE

- Diagnostics
- Research Materials

### KEYWORDS

- Zirconium-89
- 89Zr
- oxine
- cell labeling

### COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

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### DESCRIPTION OF TECHNOLOGY

This technology from the [NCI Molecular Imaging Program](#) relates to a Zirconium-89 (89Zr)-oxine complex for cell labeling, tracking of labeled cells by whole-body positron emission tomography/computed tomography (PET/CT) imaging, and associated methods. A long half-life of 89Zr (78.4 hours), high sensitivity of PET, and absence of background signal in the recipient enable tracking cells over a week using low levels of labeling radioactivity without causing cellular toxicity.

The 89Zr-oxine complex is synthesized quickly by mixing components at room temperature and produces high yields. Cell labeling is achieved by a short, room temperature incubation. The 89Zr-oxine

complex is capable of labeling a wide range of cell types of therapeutic or pathogenic relevance (natural, disease, engineered cells), independent of factors such as cell cycle or receptor expression. The label is retained during cell division.  $^{89}\text{Zr}$ -oxine labeled cells can also be easily cross labeled (for example, optically or magnetically) for multi-modality imaging and analysis. Labeled cell migration and kinetics can be analyzed and quantified *in vivo* over a week, improving research strategies and ability to develop and improve cell therapies and diagnostics.

This technology will be of interest to those engaged in cell-based therapies during which cells of various types are infused for therapeutic purposes. A broad range of cells can be labeled, tracked throughout the entire body and the method is applicable to human applications. In addition to improving the understanding of cell trafficking in general, the technology could be useful in determining whether cellular engineering improves the delivery of cells to their intended target.

This technology will also be of interest to those engaged in basic research on the behavior of cells of various types in the body under various physical or manipulated conditions.

## POTENTIAL COMMERCIAL APPLICATIONS

- Cell-based therapies during which cells of various types are infused for therapeutic purposes: A broad range of cells can be labeled, tracked throughout the entire body and the method is applicable to human applications. In addition to improving the understanding of cell trafficking in general, the technology could be useful in determining whether cellular engineering improves the delivery of cells to their intended target
- Studying behavior of cells of various types in the body under various physical or manipulated conditions.

## COMPETITIVE ADVANTAGES

- Simple preparation of a broadly-applicable cell label
- Provides high resolution imaging and monitoring over period of a week
- Low toxicity, easily combined with labeling technologies and cell therapies.

## INVENTOR(S)

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## DEVELOPMENT STAGE

- Pre-clinical (in vivo)

## PATENT STATUS

- **U.S. Filed:** US Patent Application No. 61/973,706 filed 1April2014
- **Foreign Filed:** International Patent Application No. PCT/US2015/023897 filed April 1, 2015

## THERAPEUTIC AREA

- Cancer/Neoplasm