

Chemistry of Contrast Media

Biologicals

Reporter Gene Imaging

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Learning Objectives:

- To get acquainted with different reporter gene systems for different imaging modalities.
- To learn about preclinical applications of reporter gene imaging in vivo.
- To get insight into the clinical translation of reporter gene imaging.

A variety of imaging techniques have been developed that allow non-invasive detection of gene expression or cells within intact mammals, ranging from mouse to man. The basic concepts of these imaging techniques will be discussed. Different imaging reporter genes have been developed that can be detected and quantified by these imaging techniques which allow to unravel the temporospatial dynamics of gene expression or cells within the intact living animal. We will explain methods to introduce reporter genes in cells and in vivo. Applications of reporter gene imaging can be found in different research fields. We will give some examples of the use of imaging reporter genes in preclinical neuroscience. We will highlight the potential impact of reporter gene imaging in the preclinical evaluation and clinical implementation of gene and cell therapy.