

Tracer Methods for in Vivo Kinetics Theory and Applications

267



POSITRON
EMISSION
TOMOGRAPHY

PET Clin 2 (2007) 267-277

Tracer Kinetic Modeling in PET

M'hamed Bentourkia, PhD^{a,*}, Habib Zaidi, PhD, PD^b

- The basis of kinetic modeling
- The Fick principle
- The Renkin-Crone model
- The Kety-Schmidt model
- The input function
- Kinetic modeling approaches

- The classic models
- Spectral analysis
- The maximum likelihood
- Summary
- References

This article offers an overview of kinetic modeling strategies for a wide range of problems in PET. The emphasis is on practical applications so that one can understand the potential of (and take full advantage of) this imaging modality. The basic concepts are presented in numerous publications and are only briefly discussed here. It has been suggested that if specific imaging protocols are applied to allow the extraction of physiologic parameters, PET imaging could provide an interesting database in clinical and research settings.

Exploring the human anatomy and physiology in vivo and noninvasively for disease prognosis, diagnosis, and assessment of response to treatment and follow-up is the goal of any medical imaging procedure. Virtually all medical imaging modalities operated clinically nowadays are used mainly for the detection of disease by qualitative visual inspection of the images. In research studies, however, the imaging data are quantified and further statistically analyzed before any sensitive conclusions can be drawn. This is about the methodology. What about the modality itself? First, the research is oriented based on the modality that is available to the investigator. Second, the use of any modality requires a strong collaboration between multidisciplinary

groups of investigators who have backgrounds in various scientific specialties related to the research subject. For each modality, novel techniques are continuously being developed for the accurate calculation of physiologic parameters and to better exploit the quantitative potential of the imaging modality [1]. Fig. 1 roughly depicts the extent of each imaging modality based on its widespread use [2]. In this review, the authors focus on the various approaches used in PET kinetic modeling procedures.

The kinetic modeling of PET data depends on the radiotracer used for imaging, the data acquisition protocol, and the biologic tissues under study. Each radiotracer behaves differently in the body, and the same tracer could be affected differently in different types of tissue. There are a quasi-unlimited number of PET radiotracers that can be developed. The list of available radiotracers already in use and their applications in a wide variety of imaging-based investigations could fill several pages [3]. This article focuses on the most widely used radiotracers in typical PET studies and deliberately keeps away from discussing PET data correction procedures and image reconstruction techniques that are addressed in other articles found elsewhere in

This work was supported by grant SNSF 3100A0-116547 from the Swiss National Foundation.
^a Department of Nuclear Medicine and Radiobiology, University of Sherbrooke, 3001, 12th Avenue North, Sherbrooke (QC) J1H 5N4, Canada
^b Division of Nuclear Medicine, Geneva University Hospital, CH-1211 Geneva, Switzerland
* Corresponding author.
E-mail address: mhamed.bentourkia@usherbrooke.ca (M. Bentourkia).

1556-8590/07/\$ - see front matter © 2007 Elsevier Inc. All rights reserved. doi:10.1016/j.cpet.2007.08.003
pet.elsevier.com

Tracer Methods for In Vivo Kinetics: Theory and Applications summarizes and evaluates the variety of working formulas in applying tracer methods for kinetic. Buy Tracer Methods for in Vivo Kinetics: Theory and Applications on Amazon. com ? FREE SHIPPING on qualified orders. Buy Tracer Methods for in Vivo Kinetics Theory and Applications on cr-eh.com ? FREE SHIPPING on qualified orders. Tracer Methods for in Vivo Kinetics: Theory and Applications by Shipley Reginald A. () Paperback [Shipley Reginald A.] on cr-eh.com *FREE*. Tracer Methods for In Vivo Kinetics: Theory and Applications summarizes and evaluates the variety of working formulas in applying tracer. Tracer Methods for In-vivo Kinetics: Theory and Applications. Front Cover. Reginald A. Shipley, Richard Elmer Clark. Academic Press, Jan 1, - SCIENCE.R. A. Shipley und R. E. Clark: Tracer Methods for in vivo Kinetics, Theory and Applications. XIV und Seiten. Academic Press, New York und London Okt. R. A. Shipley und R. E. Clark: Tracer Methods for in vivo Kinetics, Theory and Applications. XIV und Seiten. Academic Press, New York und. Read Now cr-eh.com?book= B01D409VJEDownload Tracer Methods for in Vivo Kinetics Theory and Applications PDF Full Ebook. tracer methods for in vivo kinetics theory and applications summarizes and evaluates the variety of working formulas in applying tracer methods for kinetic. Download Tracer Methods For In Vivo Kinetics. Theory And Applications. by DickyDickie Facebook Twitter Google Digg Reddit LinkedIn Pinterest. VIVU KINETICS THEORY AND APPLICATIONS Reginald A. Shipley Richard E. Clark VETERANS. ADMINISTRATION HOSPITAL Tracer Methods for in Vivo. Start Page: illus. Publisher: Academic Press. All titles: " Theory and applications [by] Reginald A. Shipley [and] Richard E. Clark ". " Tracer methods for in-vivo. Or you can evade up, to the download Tracer Methods for in Vivo Kinetics. Theory and Applications of this risk. This user ResearchGate emerged linked Tracer Methods for In Vivo Kinetics: Theory and applications summarizes and evaluates the variety of working formulas in applying tracer methods for kinetic. tracer kinetics in vivo. The power of PET lies in its data and the application of kinetic models, one can pose .. nonlinear regression techniques to estimate the values of K1 principle, a steady state exists in the capillary as long as the tracer .A kinetic modelling approach for the quantification of in vivo tracer studies of new imaging techniques and their translation into clinical applications. . Data- driven estimation of parametric images based on compartmental theory (DEPICT) .using fixed priming tracer steady state was not reached with- Shipley RA, Clark RE () Tracer methods for in vivo kinetics. Theory and applications.

[\[PDF\] THE KEY NOTE, New Edition](#)

[\[PDF\] Learning from Experience: The BURA Guide to Achieving Effective and Lasting Regeneration](#)

[\[PDF\] The Isle of Destiny \(The Druids of Destiny Series Book 2\)](#)

[\[PDF\] Advances in Organizational Justice \(Stanford Business Books\)](#)

[\[PDF\] El creador de fantasmas \(Spanish Edition\)](#)

[\[PDF\] Rocket Fuel For Busy Mums: 9 Natural Ways to Boost Your Energy](#)

[\[PDF\] The Essential Guide to Interpersonal Communication](#)