GrowDex®

Application Note **5**

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^{99m}Tc –labeling of GrowDex® for SPECT/CT molecular imaging studies

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DESCRIPTION

Radiolabeled hydrogels can be used in single photon emission computed tomography (SPECT)/computed tomography (CT) studies to illustrate the in vivo behavior of the hydrogel. Injectable hydrogels can be used e.g. as subcutaneous implants for controlled drug delivery. This application note describes the labeling of GrowDex® hydrogel with the radioactive tracer Technetium-99m for SPECT/CT. The labeled GrowDex can be used with single or multiple biomarkers, in studies where isotopes of different energies can be observed simultaneously.

MATERIALS

1. GrowDex (Cat No. 100 100 005, UPM)
2. Stannous chloride, solid form SnCl2, forms a stable dihydrate that is used as a reducing agent (Angiocis®, Cat No. 663548, IBA Molecular).
3. Saline solution enough for stannous chloride solution, extracting the 99mTc and preparing the labeling solution.
4. A source of 99mTc, e.g. 99mTcO4- (usually extracted from a technetium-99m generator).

METHOD FOR PREPARATION OF 1 ML ^{99m}Tc-GROWDEX

1. Prepare a 17.5 µg/ml stannous chloride stock (Tin(II) chloride dihydrate) in saline solution. NOTE: If the desired amount of 99mTc-GrowDex® is other than 1 ml, it should be noted that the final stannous chloride concentration should be 5 µg/ml.
2. Prepare and measure the activity of a saline solution containing the 99mTc.

- For small animal SPECT imaging studies, suitable final activity is 50-60 MBq per administered dose.
- Dilute the 99mTc-saline to 1042 MBq/ml to prepare the labeling solution.

3. Add 285 µl of stannous chloride stock into 667 µl of 1.5% GrowDex® in a 2 ml round-bottom test tube.
4. Mix the solution with a standard laboratory vortex mixer for 10 min.
5. Add 48 µl of 99mTc-labeling solution (1042 MBq/ml) into the mixture and mix again using the vortex mixer for 30 minutes.
6. The 99mTc-GrowDex® is now ready for use or for further processing, e.g. combing with other molecules such as biomarkers before administration.
7. The final concentration of GrowDex® is 1% and the final activity of the dose is 50 MBq.

REFERENCES

1. Laurén P et al. 2014 "Technetium-99m-labeled nanofibrillar hydrogel for in vivo drug release" Eur J Pharm Sci, vol 65, 79-88.

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