

TLC

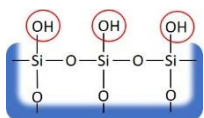
THIN LAYER CHROMATOGRAPHY

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TLC is a analytical technique used to identify the purity of a radiopharmaceutical

HOW DOES TLC WORK?

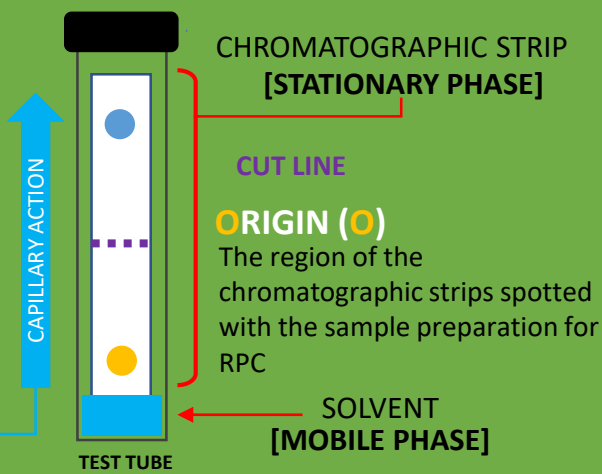
+ **-** TLC separates radiopharmaceutical compounds (RPCs) based on variances in **polarity**



Polar groups in the media construct **dipole-dipole interactions** with polar solvents and components of the RPC

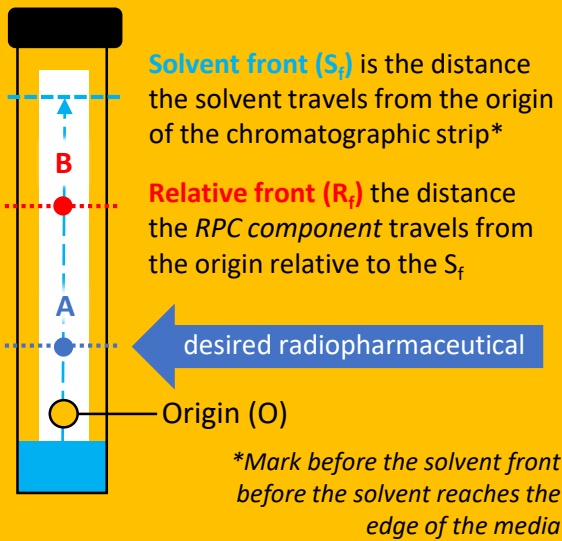
Solvent travels up the media by **adsorption** and **capillary action**. The solvent will mix with the RPC components and carry the components up media. Each component of the RPC will move up the media at different rates

CHROMATOGRAPHIC SYSTEM



SOLVENT + MEDIA

Selection of the appropriate **solvent system** permits separation of the different chemical components in RPC



Retention factor (R_f) value tell us the distance between the relative front in proportion to the solvent front, typically ranging from 0 to 1

$$R_f = \frac{(Sf - O)}{(Rf - O)}$$

R_f = Species A
 R_f = Species B

$$\% \text{ activity net count} = \frac{(O)}{(O + Sf)} \times 100$$

Nonpolar RPC components will **form weak interactions** with the media and will travel **closer towards the solvent front**

Polar RPC components will generate for **strong interactions** with the media, thus moving relatively slower

RADIOCHROMATOGRAM ANALYSIS

After development of the chromatogram, the strip will be analyzed using a method & device for counting the **radioactivity distribution**

THREE METHODS FOR RPC ANALYSIS

1. **SCAN** using a mobile radiochromatogram scanner, guide the device along the strip for activity peak
2. **DICE** the strip into multiple 1 cm pieces
3. **CHOP** the strip into two separate pieces

