

IHMR University



Thesis Defense

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Health and Hospital
Management

Overview

Major sections of this thesis
defense presentation

- Introduction
- Problem
- Research Purpose
- Research Question
- Objectives
- Methodology
- Results
- Conclusion

Introduction

Definition of Radiopharmaceuticals

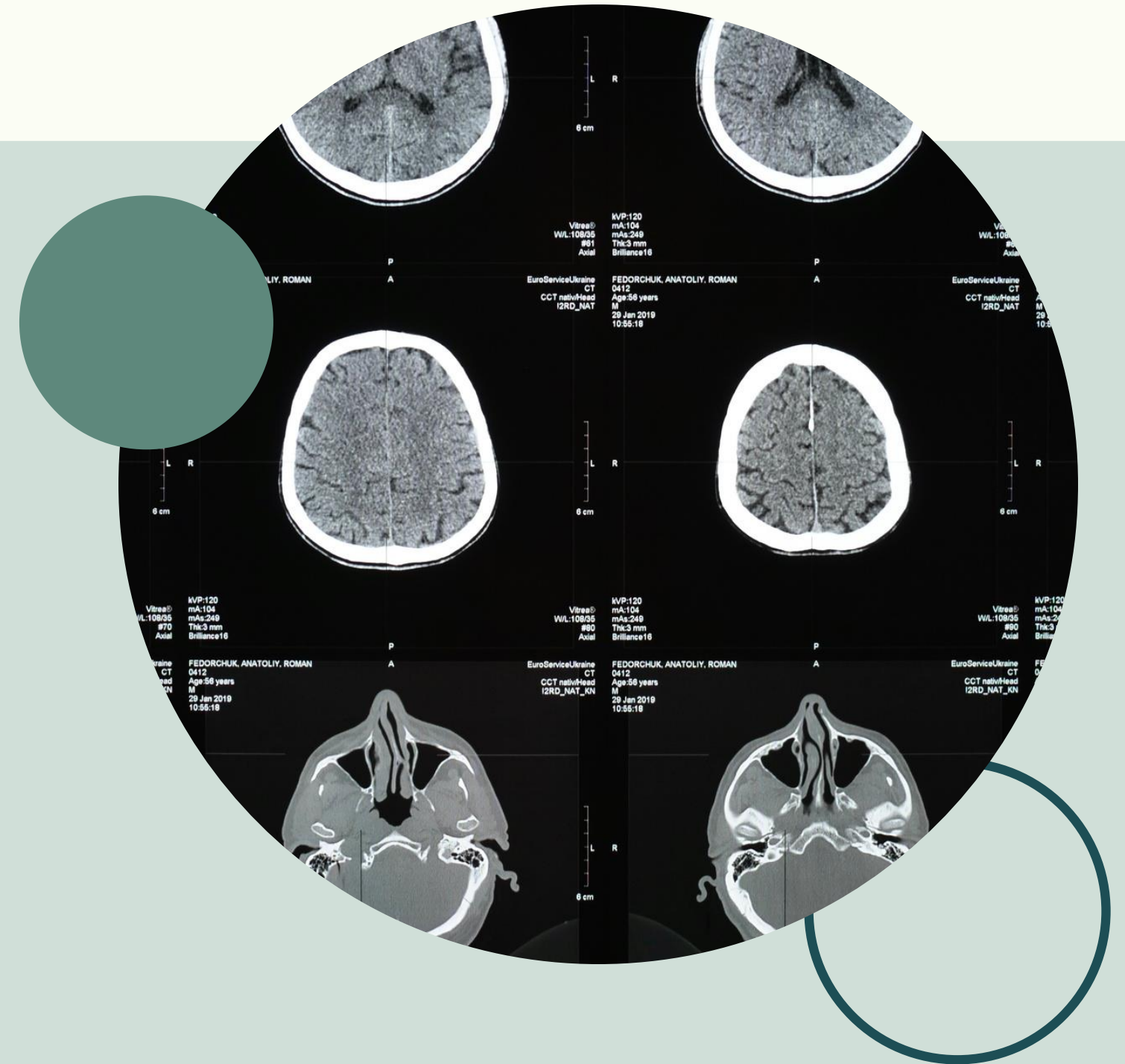
- Radiopharmaceuticals are pharmaceutical drugs containing radioactive isotopes.
- Used in nuclear medicine for diagnosis and therapy.

Importance in Nuclear Medicine

- Essential for imaging and treating diseases such as cancer.
- Enables visualization of organ function and structure.

Overview of Diagnostic and Therapeutic Applications

- Diagnostic: Positron emission tomography scans to detect and monitor diseases.
- Therapeutic: Targeted radiation treatment for conditions like cancer and thyroid disorders.



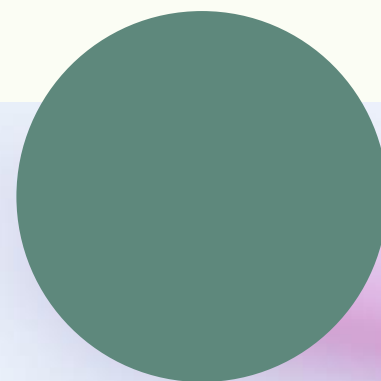
Research Purpose and Objectives

Purpose of the Research

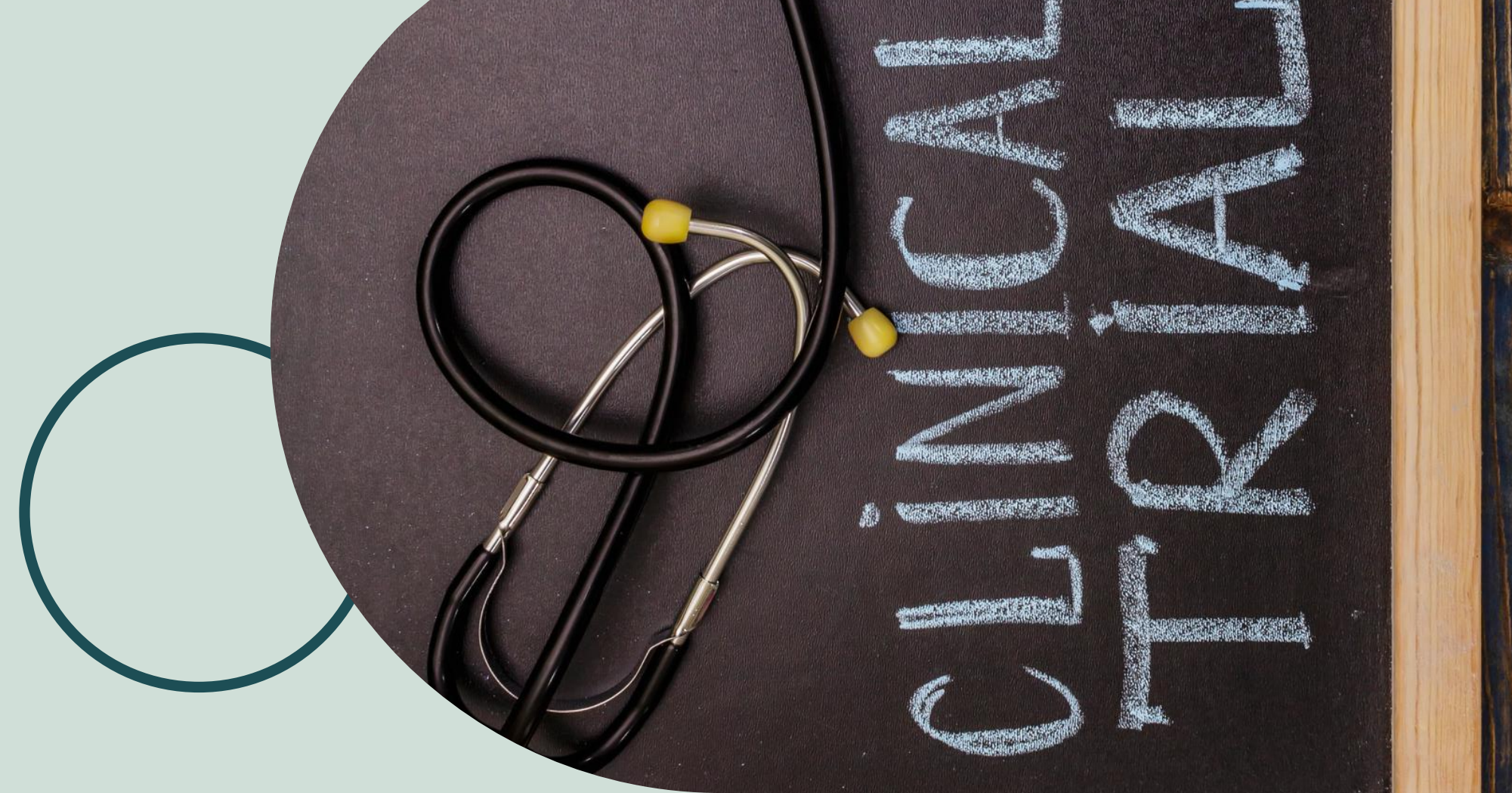
To explore the latest developments and trends in radiopharmaceuticals.

Research Questions

What are the changes in trends in radiopharmaceutical research and development, clinical trials, and product launches ?



Objectives

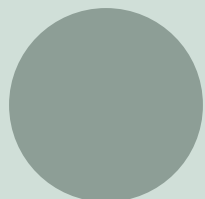


The First Objective

To review the latest developments in radioisotope production and radiolabeling techniques for radiopharmaceuticals.

The Second Objective

To study the changes in trends in radiopharmaceutical research and development, clinical trials, and product launches.



Methodology

Research Design

Study Design – Descriptive

Type of Data – Secondary Data

Data Source – ClinicalTrial.Gov , Company Pipeline

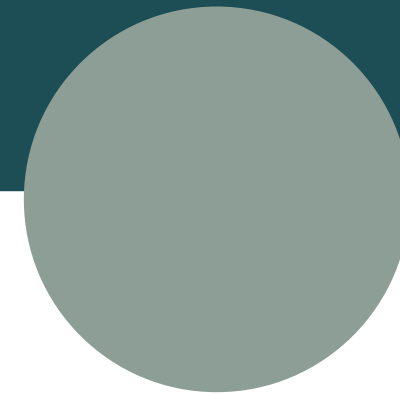
Study Setting and Population

Information gathered

Trial details: Drug Name, Phase, recruiting status , Company, Indication,
ROA , SSD , PCD , SCD)

Drug development status

Approval status and safety information



Methodology

Research Procedures

Data Collection

Identified pharma companies developing radiopharmaceuticals

Analyzed drug pipelines on company websites

Searched ClinicalTrials.gov for specific drug trials

Cross-referenced with PubMed and regulatory databases

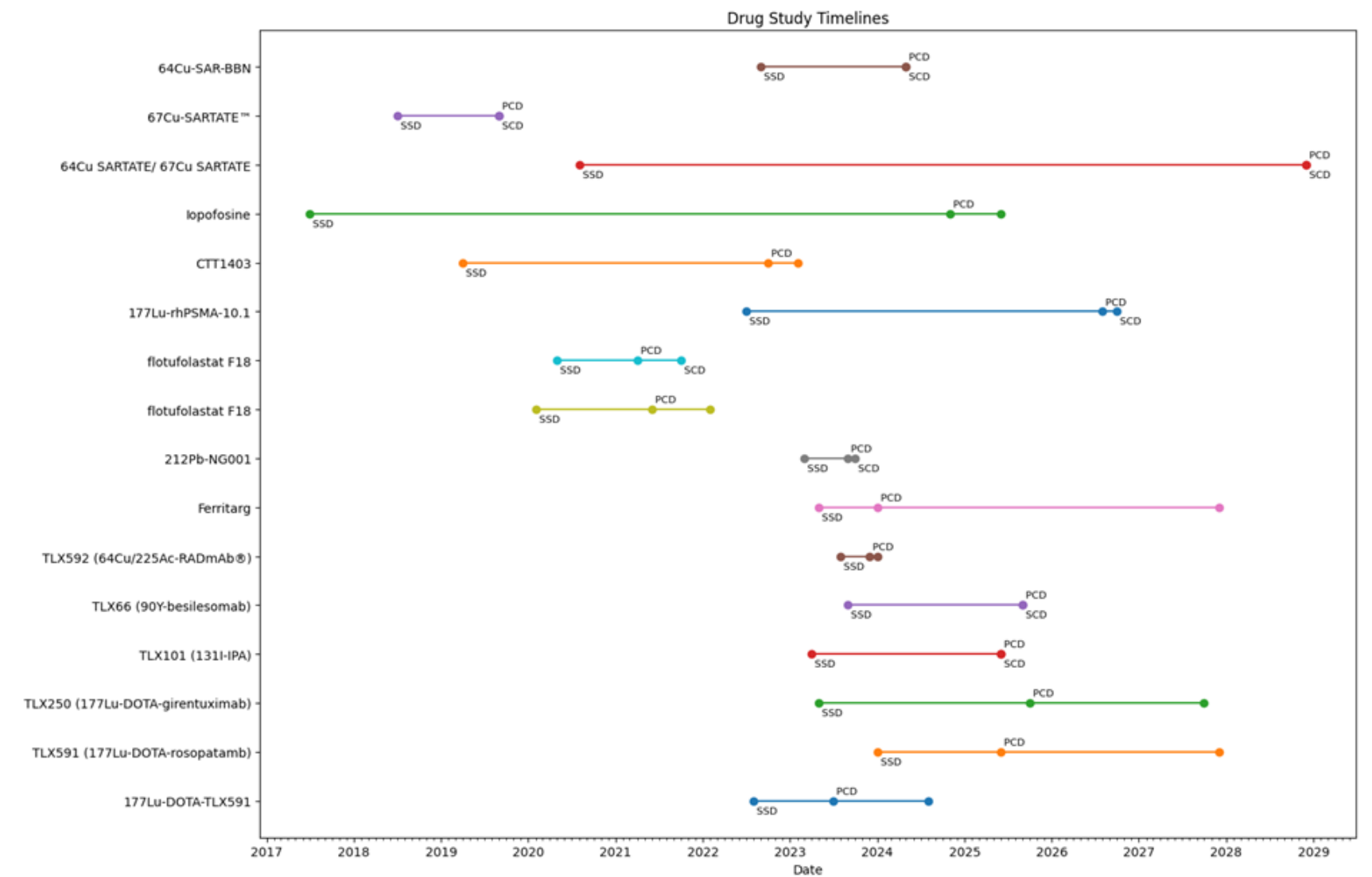
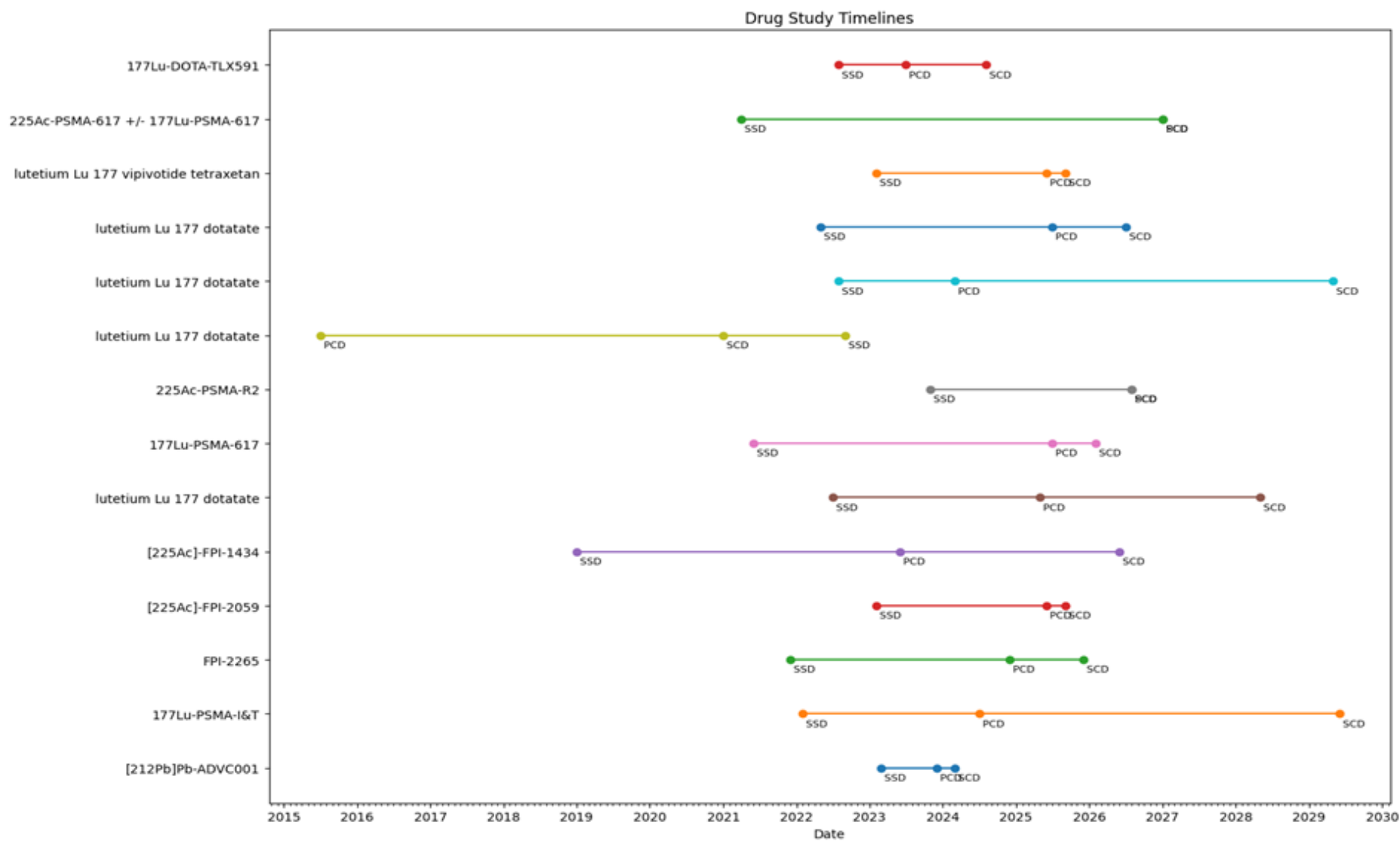
Study Instruments

Information will be compiled and sorted with the help of spread sheet applications

(Microsoft Excel/ Google sheets) , and Google Colab is used for analytical purposes



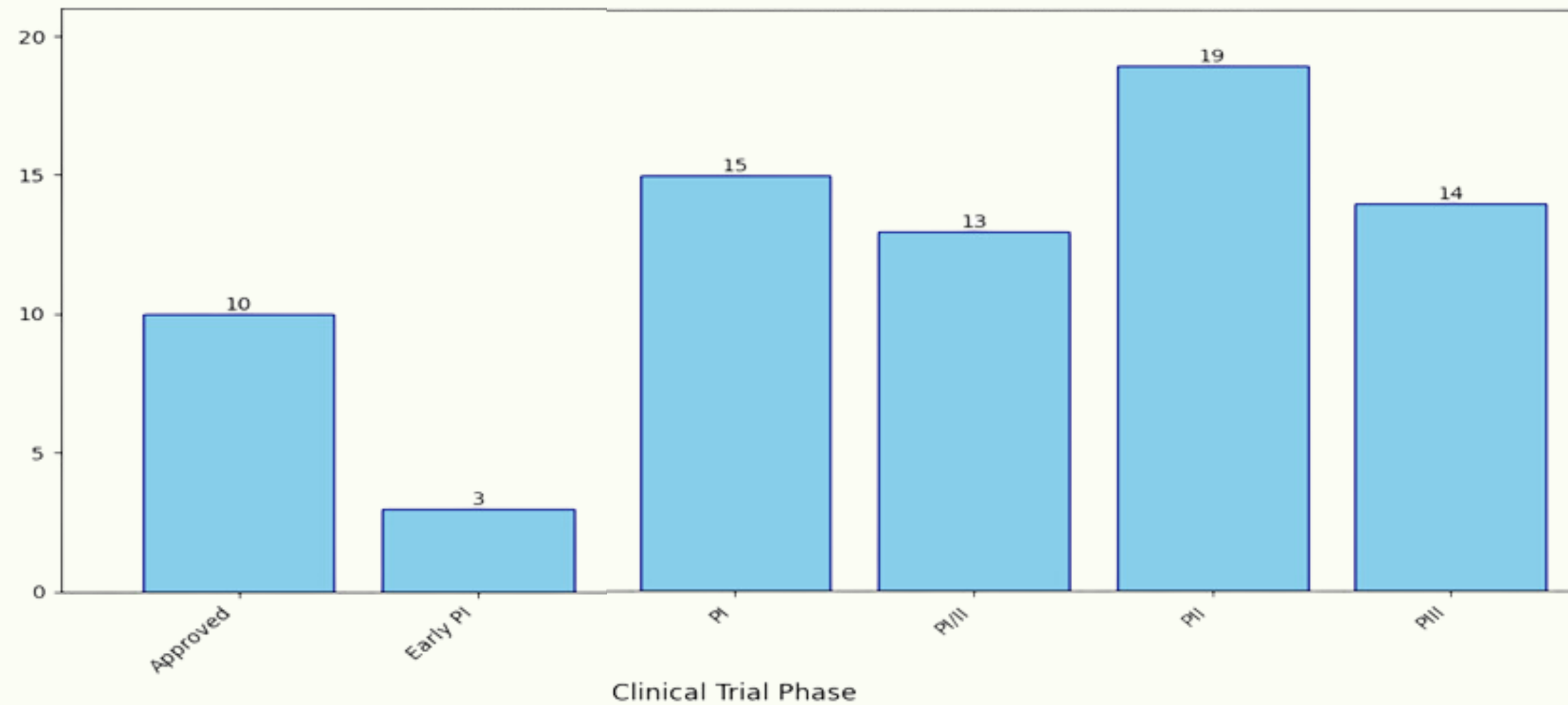
Result



Radiopharmaceuticals Timeline of SSD, PCD and SCD

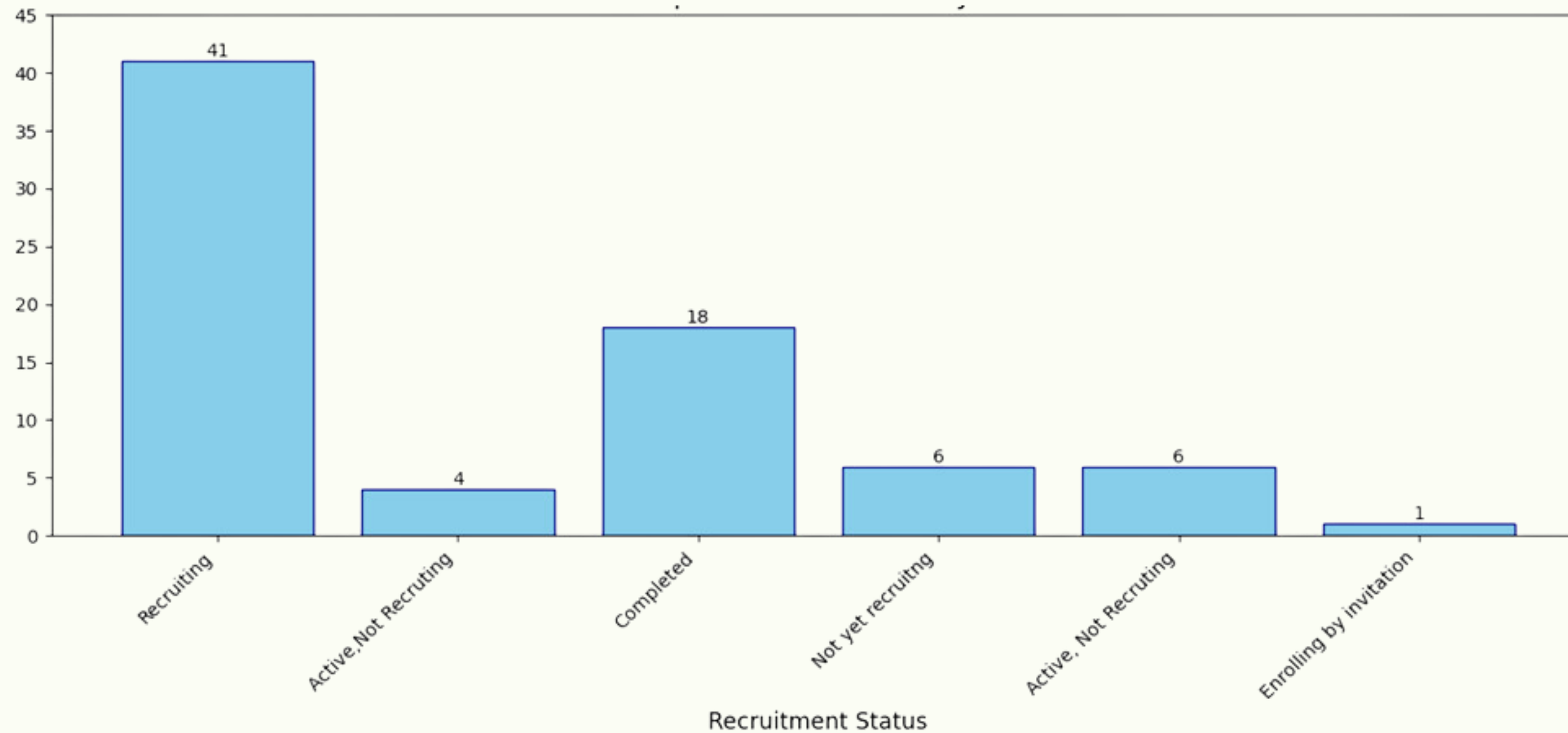
- Development duration: 5-10 years, some >10 years.
- Key milestones: Study Start Date (SSD), Primary Completion Date (PCD), Study Completion Date (SCD).
- Variation in study duration due to drug complexity, regulatory processes, therapeutic specialization

Results



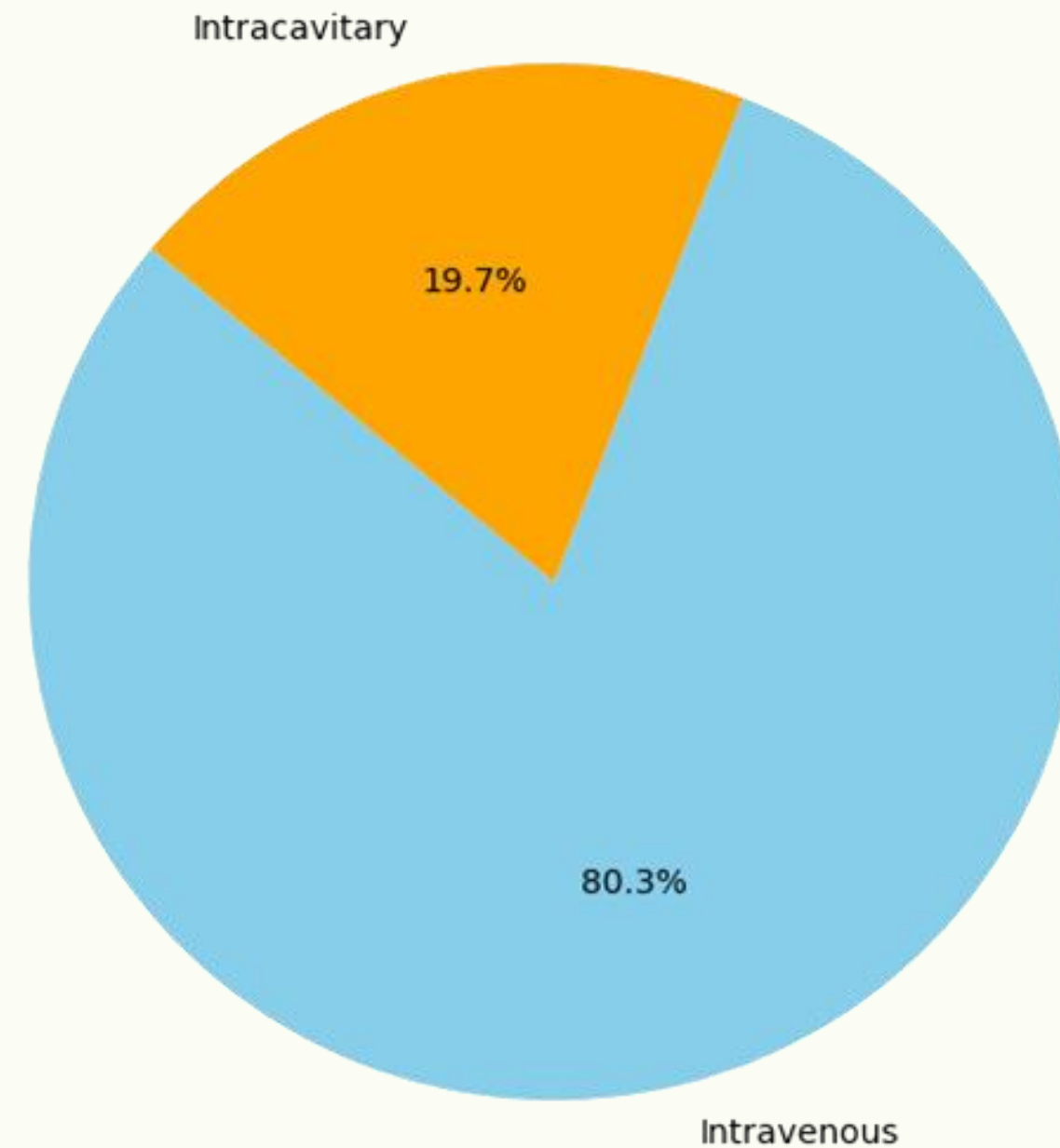
- Only 3 drugs are in the early phase, suggesting most have progressed beyond initial development.
- Phase II has the highest number of individual drugs, indicating many drugs have passed initial safety trials and are being tested for efficacy.
- 14 drugs are in Phase III, the final stage before potential approval.
- 10 drugs have already been approved, showing a significant number have made it through the entire development process.

Result



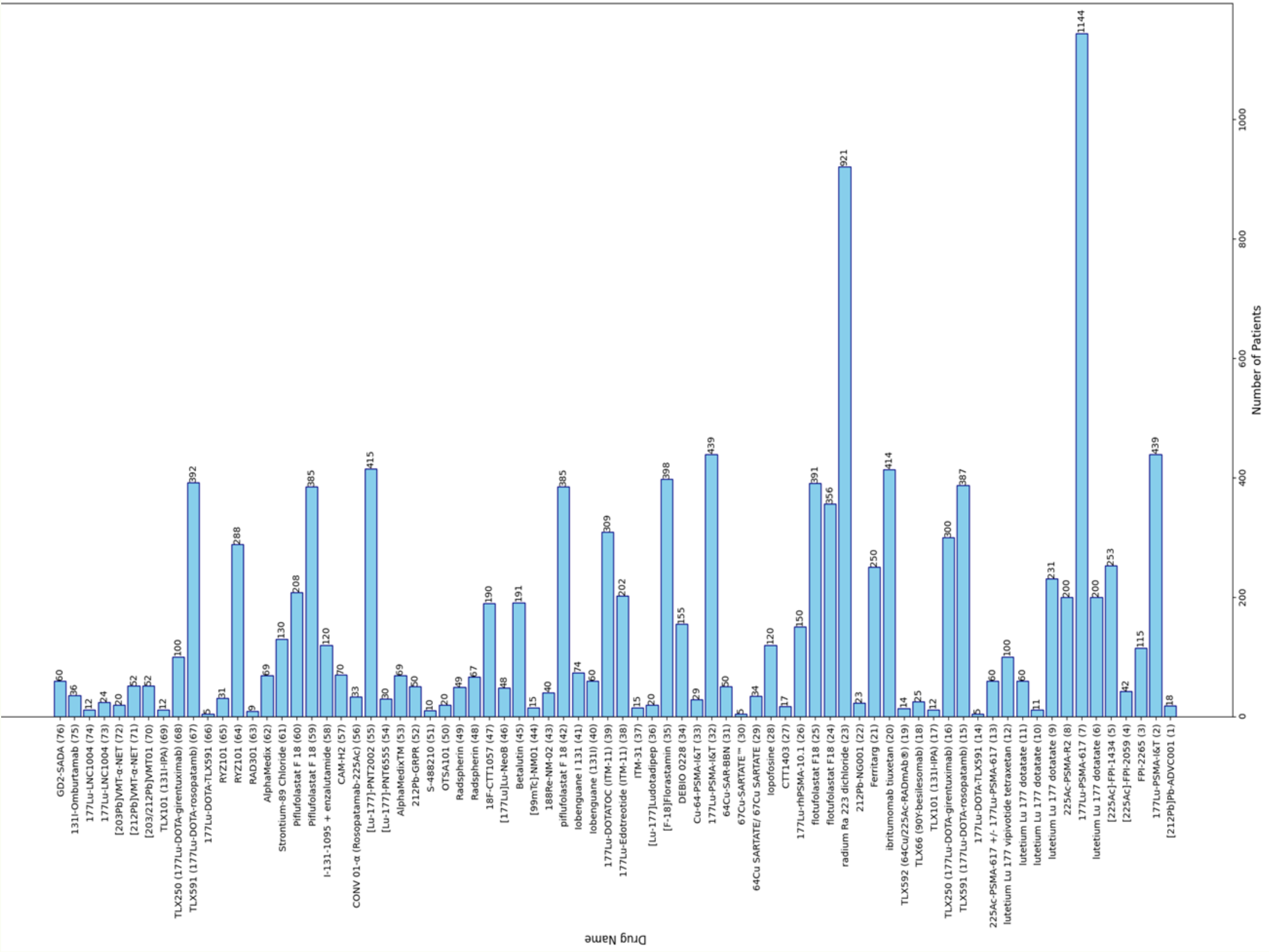
- Recruiting: 41 trials, This is by far the largest category, indicating that most trials are currently in the active recruitment phase for participants.
- Completed: 18 trials ,The second largest category, showing a significant number of trials have been finished.
- Not Yet Recruiting: 6 trials , These trials are approved but haven't started recruiting participants yet.
- Active, Not Recruiting: 6 trials , These trials are ongoing but have completed their recruitment phase.
- Active, Not Recruiting: 4 trials , This appears to be a duplicate category, possibly an error in the graph. It's unusual to have the same status twice with different numbers.
- Enrolling by Invitation: 1 trial ,Only one trial is in this specialized recruitment phase, where participants are specifically invited rather than openly recruited.

Result



- Preference for Intravenous: The vast majority (over 4/5) of the administrations are done intravenously. This suggests that most radiopharmaceuticals are designed for or most effective when delivered directly into the bloodstream.
- Specialized Applications: Nearly 1/5 of administrations are intracavitary, indicating a significant subset of treatments that target specific body cavities. This could be relevant for localized treatments or diagnostics.

Results



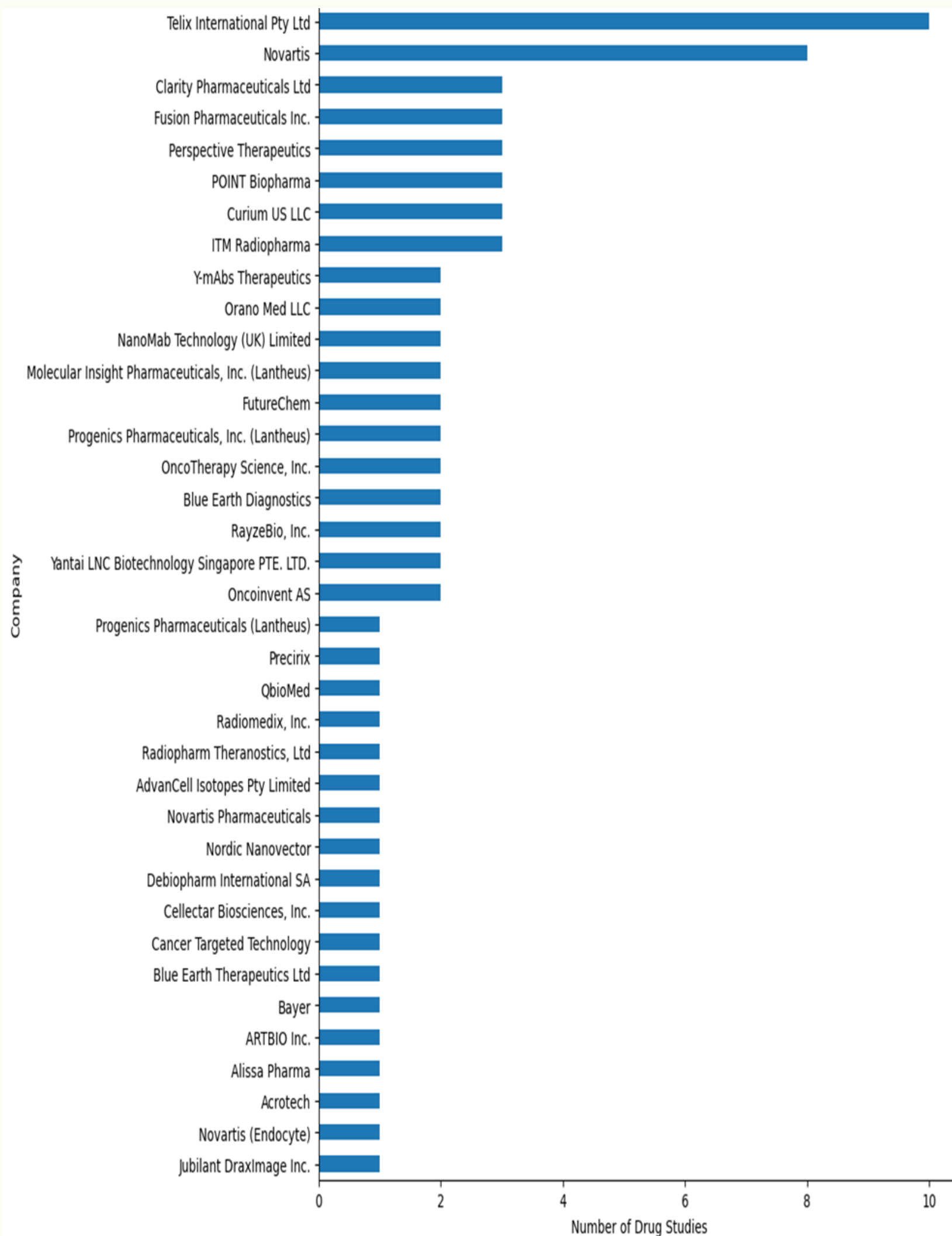
Highest patient numbers

- 177Lu-PSMA-617 (7) has the highest number of patients at 1,144.
- radium Ra 223 dichloride (23) has 921 patients.
- TLX591 (177Lu-DOTA-rosopatamb) (67) has 492 patients.

Lowest patient numbers

- Many drugs have very low patient numbers (10 or fewer), which might indicate early-stage trials or rare condition treatments.

Results



Leading companies

Telix International Pty Ltd is the clear leader, with approximately 9-10 drug studies.

Novartis follows closely, with around 8 studies.

Mid-range companies

Several companies are conducting 3-4 studies each, including Clarity Pharmaceuticals Ltd, Fusion Pharmaceuticals Inc., Perspective Therapeutics, POINT Biopharma, Curium US LLC, and ITM Radiopharma.

Lower-range companies

A large number of companies are conducting 1-2 studies each, representing the majority of the companies listed.

Conclusion



CONCLUSION

- Radiopharmaceuticals are revolutionizing diagnostic and therapeutic imaging in nuclear medicine.
- Significant progress has been made in the development and application of these technologies.
- Challenges remain, including regulatory hurdles and the need for comprehensive research on adverse effects.

THANK YOU