

Project Specification – Development & production in GMP environment of a precursor for PET-imaging

1. Project Scope

This project is conducted in collaboration with the University of Bordeaux and the Bordeaux University Hospital (CHU de Bordeaux), within the framework of a maturation program aimed at supporting the transition from research to early clinical development.

The scope includes the synthesis, manufacturing, and supply of a precursor intended for use in toxicological studies and clinical trials. The precursor shall be produced in compliance with Good Manufacturing Practices applicable to active pharmaceutical ingredients (ICH Q7, Chapter 19) without process validation and validation of analytical methods, for use in phase I imaging clinical study. The required quantities of the precursor will be defined in this specification document.

2. Objective

The objective of this project includes the transfer and take-over of the existing process and analytical methods, followed by the manufacturing of the precursor according to GMP standards for use in toxicology study and clinical trials. The project also includes the initiation of 24-month ICH-compliant stability studies on both the bulk material and the filled vials.

3. Description of the workpackages

WP1 – Process take-over

The process take-over will include :

- Perform the transfer and take-over of the existing synthesis process, including available documentation and know-how,
- Assess and adapt the process for suitability in a GMP environment with an approach adapted to microdose applications,
- Ensure acceptable robustness and reproducibility for small-scale GMP production,
- Document the process in a GMP-compatible format.

WP2 – Analytical Method Development

Analytical method development covers :

Project specification : GMP synthesis of precursor

Page 1 /5

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- Develop and validate HPLC analytical methods for intermediates and the final precursor, ensuring suitability for quality control (specificity, sensitivity, reproducibility),
- Define analytical conditions and system suitability criteria,
- Provide documented analytical procedures and supporting data for later routine QC use.

WP3 – Stability and Formulation for Toxicological Studies

This workpackage will include :

- Supply a formulation of the peptide suitable for a single extended-dose toxicity study in male & female mice;
- Conduct stability testing over a period of two weeks at 2–8°C to verify appropriate conditions for storage of the solution,
- Define preparation and handling procedures.

WP4 – GMP Batch Manufacturing

The GMP batch will be used for clinical trial and requires :

- Manufacture one GMP batch of the Precursor (~0.01 g or minimum order quantity) under conditions compliant with GMP principles adapted to phase I imaging clinical study,
- Ensure traceability of materials and key process steps,
- Fill one hundred vials (2R format), each containing between 35µg of Precursor (±20%).

The supply will be divided into three steps : first delivery intended for toxicological study of minimum 2 vials, second delivery for DME (Dossier Médicament Expérimental : Experimental Drug File) and third delivery for a phase I imaging clinical study,

- Perform release testing in accordance with defined specifications, including stability and retest studies at twelve and twenty-four months,
- Label and package the vials under appropriate controlled conditions as required for clinical use,
- Provide a Certificate of Analysis.

WP5 – CMC Documentation

The Contractor will provide the corresponding CMC documents :

- Prepare Chemistry, Manufacturing and Controls documentation in accordance with early clinical development requirements,
- Compile all relevant manufacturing, analytical, and stability data,

Project specification : GMP synthesis of precursor

Page **2 /5**

- Ensure consistency between process description, analytical methods, and batch data included in the dossier.

4. Compound & Manufacturing process

Compound to be manufactured : peptide compound containing 6 amino acid coupled with a linker and a chelate macrophage (NOTA, DOTA or DOTAGA).

Synthesis route : Solid Phase Peptide Synthesis (SPPS).

5. Temporary product specifications

	Control	Test/method	Acceptance criteria	Comments
GMP precursor – bulk material	Appearance	Visual	white to off-white solid	
	Impurities	HPLC	total impurities ≤ 3.0 % any unspecified impurity ≤ 2.0 % (reporting threshold ≤ 0.2 %)	
	Water content	Karl Fischer	TBD	
	Residual solvents	GC	≤ 0.5 % acetonitrile ≤ 0.5% TFA	
	Net peptide content	HPLC	25µg-30µg±5µg	
	Assay		TBD	
	Counter ion		Acetate	
	Bioburden		TAMC ≤ 1000 CFU/10mg TYMC ≤ 1000 CFU/10mg Endotoxin ≤ 1 EU/mg	
Filling	Appearance	Visual	white to off-white solid	
	Amount of filling		35 µg (± 20%)	
	Identity	HPLC	retention time conforms with bulk substance ± 0.5 min	

	Purity		≥ 95%	
	Impurities (related substances, HPLC)		total impurities ≤ 3.0 % any unspecified impurity ≤ 2.0 % (reporting threshold ≥ 0.2 %)	
	Bioburden		TAMC ≤ 100 cfu/Vial TYMC ≤ 10 cfu/Vial Endotoxin ≤ 5 EU/vial	
Retest	GMP retained sample		Expected time points T0, T+12M, T+24M Control of : related impurities, bioburden, bacterial endotoxins, amount of filling	

6. Required documentation

Only complete applications will be considered. Submitted dossiers must include all the elements listed below.

Technical and Financial Offer (English or French possible)

- Financial proposal including a detailed breakdown of the different project phases, costs, timelines, and associated deliverables,
- References relevant to the topic: expertise in GMP synthesis of imaging precursors (e.g. radiopharmaceutical or contrast agent precursors), knowledge of the research and clinical translation environment,
- Technical approach: description of the synthetic pathway for the imaging precursor, process development and optimization strategy, scale-up under GMP conditions, analytical methods (purity, identity, impurities), validation strategy, and quality control procedures, description of proposed solution(s),
- Compliance with ICH Q7 and GMP requirements,
- Detailed project schedule,
- CVs of the team members.

Administrative Documents (French required): CCTP, Commitment Form, CCAP

- The Commitment Form (Acte d'Engagement) and its annexes provided by the candidate,
- The Special Administrative Terms and Conditions for ICT/IP (CCAP),
- This Special Technical Specifications Document (CCTP), dated and signed, of which the original archived by Aquitaine Science Transfert shall prevail.

- Signed consultation rules (Règlement de consultation),
- DC1 form,
- DC2 form,
- Document attesting to the authorization of the signatory,
- In case of judicial reorganization, a copy of the relevant court decision(s).

7. Scope of services

All activities should be carried out by the service provider.

Expected deliverables:

- Monthly project review meetings and/or specific meetings,
- Summary of activities performed,
- Any agreed outputs or project-specific deliverables : batch records, analytical reports, stability reports, CMC documentation,
- Final project report summarizing all activities, results, and conclusions.

Expected start date: September 1, 2026

Duration: 9 months.

8. Confidentiality and Intellectual Property

All data, results, and documentation generated during the project shall be treated as confidential and managed in accordance with agreed contractual terms.

All results, data, reports, and deliverables produced during this project shall become the property of the client upon full payment of the services performed.

Any background intellectual property (background IP) owned by the service provider prior to the project shall remain its property. However, the client shall be granted a right to use such background IP to the extent necessary to exploit the project results.