



Brief to Search

For a Computer scientist

Permanent contract, Based in Tours, France

For MABSilico



MABSilico in brief

Summary:

MABSilico is a French deeptech company which designs and implements computational solutions for the development of therapeutic antibodies and bio-drugs, which are used in an increasing number of pathologies, including oncological diseases. MABSilico aims at creating a formal approach of antibody development, reducing the risks of failure and the duration of pre-clinical steps as well as strengthening intellectual property protection. Conventional approaches for the discovery and pre-clinical development of such drugs take two to three years, while MABSilico technologies allow shrinking this time to a few weeks.

This technology based on artificial intelligence and machine learning is the result of more than twenty years of French scientific research (laboratories affiliated to INRAe and CNRS).

Strategy:

MABSilico develops computational methods based on artificial intelligence for the selection, characterization and optimization of antibodies. Once completed, methods will allow generating a few candidates ready for final experimental validation and pre-clinical tests, reducing this phase of the development of a therapeutic and/or diagnostic biomolecule from 3 years to few weeks. MABSilico is also very attentive to the extensive experimental validation of its methods. For this reason, MABSilico conducted since its very beginning experimental validation of its own algorithms as proof of concept. These experiments are either conducted in-house, or through collaborations with academic partners or private companies. Our products are distributed through a scalable SaaS platform integrating within our clients' workflows.

SaaS – Platform Technology:

The MABSilico pipeline consists in a suite of AI-based tools, allowing the selection, characterization and optimization of leads in a few hours. Some of these tools have already been in operation for two years, such as MABTope, which allows predicting the epitope of an antibody in less than one hour. This method has now been extensively validated. The methods MABBinning (allowing to cluster antibodies within a very large group along their ability to bind a same target at the same epitope), MABCross (allowing to predict off-targets: proteins to which the antibody binds, other than its primary target) and MABHuman (antibody framework humanization) are also operational.

Machine Learning:

Antibody repertoires are very large. A single individual possesses approximately 10^{12} different antibodies, and the number of possible antibodies is even much higher. Among these, only a small fraction represents real therapeutic solutions with high affinity and specificity. To rationalize the search of 3D-templates space, MABSilico is leveraging AI and machine learning algorithms to pull the most promising candidates.

Experimental validations are then conducted in-house to validate predictions. With this back and forth approach, MABSilico is pretty unique as a deep-tech company.

Background:

Since its inception in 2017, MABSilico has grown to 10 FTE, including 7 PhDs. MABSilico has been selected as one of the six winners of the Bpifrance Concours d'innovation, i-Nov, award in "Bioproduction" track in 2019 and other international grants like Bill and Melinda Gates Foundation. With more than 55 clients in pharma industry, MABSilico is one of the world leader in the field of computational antibody drug discovery.

The team is divided into three departments: (1) biology, (2) software engineering & data science and (3) Computational sciences. This team has been tasked with the exciting challenge of developing various tools that can guide biologists, speed up lab efforts and lead generation of new therapeutic strategies. It's a multidisciplinary team that includes protein engineers, data scientists, bioinformaticians and



software engineers. Each department is engaged in both capability development projects and asset development projects.

The company is now seeking to recruit a highly motivated and talented **Computer Scientist**. This person will work with the team to coordinate the implementation of the most recent advances in Machine Learning and Graph theory fields that can now be transposed to Antibody and Immunology development. In close collaboration with the Head of Biologics and Computer Science, the candidate will have to be ready in a foreseeable future to coordinate new modules integration and work with the CSO to define where to apply the forthcoming innovations for the greatest benefit and success.

Your role at MAbSilico

The computer scientist plays a key strategic role in defining and implementing the forthcoming modules of MAbSilico and driving proof of concept and *in silico* benchmark validation. In collaboration with our data scientist, the candidate helps and guides the collection of new data to build a strong and innovative product for antibody drug discovery and development.

Your experience and skills

Experience:

- Has actively managed development of ML pipeline using end-to-end platforms like TensorFlow/pyTorch Github versioning.
- Has proven track record as a highly effective programmer mastering at least two programming languages Python/C/C++ is highly appreciated.
- Familiarity with traditional bioinformatics-based approaches to protein engineering and how to leverage ML-based approaches to increase predictive power.
- Knowledge of Docker and App containerization is appreciated.
- Familiarity with High Performance Computing (HPC) solutions will be considered.
- Demonstrated ability to move into new scientific, therapeutic and technology areas.

Skills and knowledge:

- Deep scientific understanding of *in silico* experiments and how to bring the most advances in AI and data mining, algorithms to protein/antibody engineering and structure recognition.
- Experience and understanding of IP and the patent landscape around antibody-based therapeutics is a plus.
- Demonstrate excellent communication and interpersonal skills, including conflict resolution.
- Understands our business and its wider market and regulatory environment.

Personal attributes:

- Comfortable and calm in a rapidly changing environment.
- Willing to take a risk on something as yet unproven.
- Raises internal expectations of individual and collective excellence.
- English speaking proficiency is required and French knowledge is an advantage.

The key responsibilities

R&D Computer Science Team:

- *R&D program design*: the computer science provides expertise in most up-to-date Machine learning strategies, he/she helps to design asset development programs that will provide scientific support validating MAbSilico solutions and helps to design asset development programs to integrate these solutions to MAbSilico proprietary pipeline.
- *R&D delivery*: the computer scientist coordinates the delivery of asset development programs to *in vitro/in vivo* validation. This involves collaboration with the wet lab team and data scientists. The computer scientist ensures ongoing projects are well managed and properly resourced.

Pipeline Strategy:

- *Pipeline design/implementation*: the computer scientist provides technical and highly qualified expertise that informs the asset development projects the company undertake.
- *Biological background*: the computer scientist identifies team resourcing gaps and training if needed.

Marketing:



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- The computer scientist works with the CSO on the publication strategy such as white papers, peer reviewed journal submission, demos. He/she can propose data and results for publication and might participate to international conferences.

Business development:

- *Support material:* the computer scientist works closely with the business development team to define Handbook/key notes to define MAbSilico's market positioning and therapeutic focus areas.
- *Technical presentation:* the computer scientist prepares with the business team technical meetings for prospect and customers.

Fundraising and board-level engagement:

- *Fundraising/Grant application:* under the supervision of the CSO, the computer scientist might worked on fundraising and grant proposal.

Organization

The computer scientist works in the R&D team under the supervision of the CSO. You are collaborating with product development team (SaaS) and the biological team.

The activity is located in the office of MAbSilico in the city of Tours (France). The activity is on-site with 1 day per week on remote. Meetings are organized by the CSO and minutes will be shared with the board reporting monthly. The permanent contract will start asap.

Salary & Holidays

Depending on experience.

The number of paid holidays correspond to 25 working days (i.e. 5 weeks of paid holidays) for a full year's work during the reference period taken into account.

Position evolution

As part of a startup you job position :can evolve in line with the scaleup and growth of the company. Your position as R&D can lead you to work on top notch and state-of-the art technologies in scope of ML and AI for antibody drug discovery. This might give you opportunities to publish scientific papers. MAbSilico needs an engineer computer scientist to work immediately on R&D projects for at least the next 24 months. MAbSilico encourages training of its employees and proposes to organize with the computer scientist it training scheme that can include the enrolment of the employee in a PhD training program that can be conducted in MAbSilico and in collaboration with research Institutes. The enrolment can take place after minimum of 24 months.

