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# DMP du projet "Spectral database of the subspecies of the *Mycobacterium abscessus* complex (MALDI-TOF MS)"

Plan de gestion de données créé à l'aide de DMP OPIDoR, basé sur le modèle "Science Europe - DMP template (english)" fourni par Science Europe.

## Plan Details

<b>Plan title</b>	DMP du projet "Spectral database of the subspecies of the <i>Mycobacterium abscessus</i> complex (MALDI-TOF MS)"
<b>Language</b>	fra
<b>Creation date</b>	2021-03-27
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## Project Details

**Project title** Spectral database of the subspecies of the *Mycobacterium abscessus* complex (MALDI-TOF MS)

**Abstract** Subspecies of the *Mycobacterium abscessus* complex (MABSC) are opportunistic pathogenic bacteria which are difficult to cure because of natural inducible resistance to clarithromycin (CLA) in certain subspecies. Identification of the 3 subspecies (*M. abscessus*, *M. bolletii* and *M. massiliense*) of MABSC is unsatisfactory by mass spectrometry (MALDI-TOF MS).

The objective of this work is to improve the performance of MALDI-TOF MS for the identification of subspecies of *M. abscessus* complex

**Start date** 2020-01-01

**End date** 2021-12-31

## Research outputs :

1. Mass spectra of *Mycobacterium abscessus* complex (Mass spectra of *Mycobacterium abscessus* complex)

## Contributors

Name	Affiliation	Roles
Alexandre Godmer		<ul style="list-style-type: none"><li>• Coordinateur du projet</li><li>• Personne contact pour les données</li><li>• Responsable du plan de gestion de données</li></ul>

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## 1. Data description and collection or re-use of existing data

### 1a. How will new data be collected or produced and/or how will existing data be re-used?

- Clinical strains of *Mycobacterium abscessus* complex will be routinely collected prospectively in the bacteriology laboratory of APHP.6 (Sorbonne Université) and associated CNR for Mycobacteria.
- We used a collection of **41 strains of MABSC corresponding to 1001 mass spectra** :
  - 15 strains of *Mycobacterium abscessus* subsp. *abscessus* (633 mass spectra)
  - 9 strains of *Mycobacterium abscessus* subsp. *massiliense* (204 mass spectra)
  - 7 strains of *Mycobacterium abscessus* subsp. *bolletii* (164 mass spectra)
- Each strain and will be analyzed by MALDI-TOF mass spectrometry according MycoEx protocol (Bruker) and molecular method (DNA/DNA hybridization, using GenoType NTM-DR (Hain Lifescience, Nehren, Germany) according to the manufacturer's instructions) for identification. The spectra were obtained according to the following steps :
  - Each of the 41 strains was cultured in aerobic atmosphere at 37°C for 7±2 days on blood agar (COH, bioMérieux®). Then, one colony was extracted according to the MycoEx protocol (Bruker®). For each of the extracts, 8 technical replicates were realized and analyzed by MALDI-TOF MS (Bruker®). Dried spots were overlaid with 1µL of MALDI matrix (α-HCCA).
  - Data acquisition was performed using a Microflex LT (Bruker® Daltonics) mass spectrometer equipped with a N2 laser (λ =377 nm). Instrument parameters used were as follows: a mass range between 200-20000 Da, ion source 1: 20 kV, ion source 2: 18.5 kV, lens: 8.45 kV, pulsed ion extraction: 330 ns, laser frequency: 20.0 Hz. Spectra were obtained after 500 shots. Each spot was analyzed three times. In total 24 spectra were obtained for each extraction.
  - Spectra acquired for each isolate were visualized and analyzed using Flex Analysis software (Bruker® Daltonics), and spectra with low quality peaks were removed. A minimum of 20 spectra per extraction was necessary to validate the extraction.

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### 1b. What data (for example the kind, formats, and volumes), will be collected or produced?

Data are :

- **Metadata** : tables containing random name of the strain, molecular identification of the subspecies from *Mycobacterium abscessus* and if it's possible molecular detection of clarithromycin susceptibility.
- **Raw data** : spectral characteristics (mass-to-charge ratio ( $m/z$ ) and intensities) in a .csv or .flex format for each strain. A minimum of 20 mass spectra could be collected for one strain.
  - Our database contains 41 strains of the MABSC complex provided by the CNR of non tuberculosis mycobacteria (15 strains of *M. abscessus* subsp. *abscessus*; 9 *M. abscessus* subsp. *massiliense* and 7 strains of *M. abscessus* subsp. *bolletii* .
  - A total of 1001 spectra were collected with 633 spectra of the *abscessus* subspecies, 164 spectra of *bolletii* and 204 spectra of *massiliense*.

The total raw data and the metadata files will have a total size less than 2GB.

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## 2. Documentation and data quality

**2a. What metadata and documentation (for example the methodology of data collection and way of organising data) will accompany the data?**

- **Patient information will not be collected.**
  - Only the **molecular identification** of the strains will be collected and the precise identification of the strain as well as its phenotypes of resistance to antibiotics.
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**2b. What data quality control measures will be used?**

- The molecular identification of the strains (DNA / DNA hybridization) corresponding to subspecies identification will be listed (gold standard).
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### **3. Storage and backup during the research process**

**3a. How will data and metadata be stored and backed up during the research?**

- The data will be saved on a dedicated research hospital computer at Centre d'Immunologie et des maladies infectieuses (CIMI Paris) ; INSERM U1135.
  - A back-up is performed on external hard drive every month.
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**3b. How will data security and protection of sensitive data be taken care during the research?**

- Sensitive patient data will not be collected.
  - Each strain will be assigned a random number.
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### **4. Legal and ethical requirements, codes of conduct**

**4a. If personal data are processed, how will compliance with legislation on personal data and on security be ensured?**

No personal data are processed.

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**4b. How will other legal issues, such as intellectual property rights and ownership, be managed? What legislation is applicable?**

- The database has been the subject of an invention declaration.
  - The Sorbonne University is the owner of the database.
  - These questions are managed by Satt lutech (<https://www.sattlutech.com/>). This organisation linked to Sorbonne University
  - **Please contact : [medecine-drv@sorbonne-universite.fr](mailto:medecine-drv@sorbonne-universite.fr) for data access.**
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#### 4c. What ethical issues and codes of conduct are there, and how will they be taken into account?

- These questions are managed by Satt lutech (<https://www.sattlutech.com/>). This organisation linked to Sorbonne University
  - **Please contact : [medecine-drv@sorbonne-universite.fr](mailto:medecine-drv@sorbonne-universite.fr) for access.**
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## 5. Data sharing and long-term preservation

#### 5a. How and when will data be shared? Are there possible restrictions to data sharing or embargo reasons?

- The data will be available after agreement with the Satt lutech.
  - **Please contact : [medecine-drv@sorbonne-universite.fr](mailto:medecine-drv@sorbonne-universite.fr) for data access** (reference : X21 – AUBRY/GODMER (MABSC)). This organisation linked to Sorbonne University
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#### 5b. How will data for preservation be selected, and where data will be preserved long-term (for example a data repository or archive)?

The data will be saved on a dedicated research hospital computer at Centre d'Immunologie et des maladies infectieuses (CIMI) ; INSERM U1135.

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#### 5c. What methods or software tools are needed to access and use data?

- Access to data is managed by Satt lutech (<https://www.sattlutech.com/>). All data could be available after prior agreement with this structure. This organisation linked to Sorbonne University.
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#### 5d. How will the application of a unique and persistent identifier (such as a Digital Object Identifier (DOI)) to each data set be ensured?

- A deposit number is being obtained.

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## **6. Data management responsibilities and resources**

**6a. Who (for example role, position, and institution) will be responsible for data management (i.e. the data steward)?**

These questions are managed by Satt lutech (<https://www.sattlutech.com/>). This organisation linked to Sorbonne University.

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**6b. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?**

Access to data is managed by Satt lutech (<https://www.sattlutech.com/>). All data could be available after prior agreement with this structure. This organisation linked to Sorbonne University