



New resources for food safety research and innovation: The CARE collection of foodborne bacteria and rStrainSelect, a R-tool for strain selection from JIP CARE

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Surveillance and Risk Assessment
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The CARE collection of foodborne bacterial pathogens

Impact & added value

1. **Build up a physical collection of FB bacterial pathogens**
 - Access to well characterized strains
 - Issued from the food/vet/clinical european surveillance activities
 - A focus on AMR relevance (antibiograms and predicted ARG)
2. **Database and web portal for querying and ordering strains**
 - Full visibility of the collection
 - Facilitate the construction of set of strains for development and research purposes
3. **Sustainability of the CARE collection**
 - Collection kept in mBRCs whose mission is to validate, conserve and distribute microbiological resources



Bacterial species included in the CARE collection

CARE WP2 Expert groups: Focus on 7 bacterial genus corresponding to the main bacterial foodborne threats

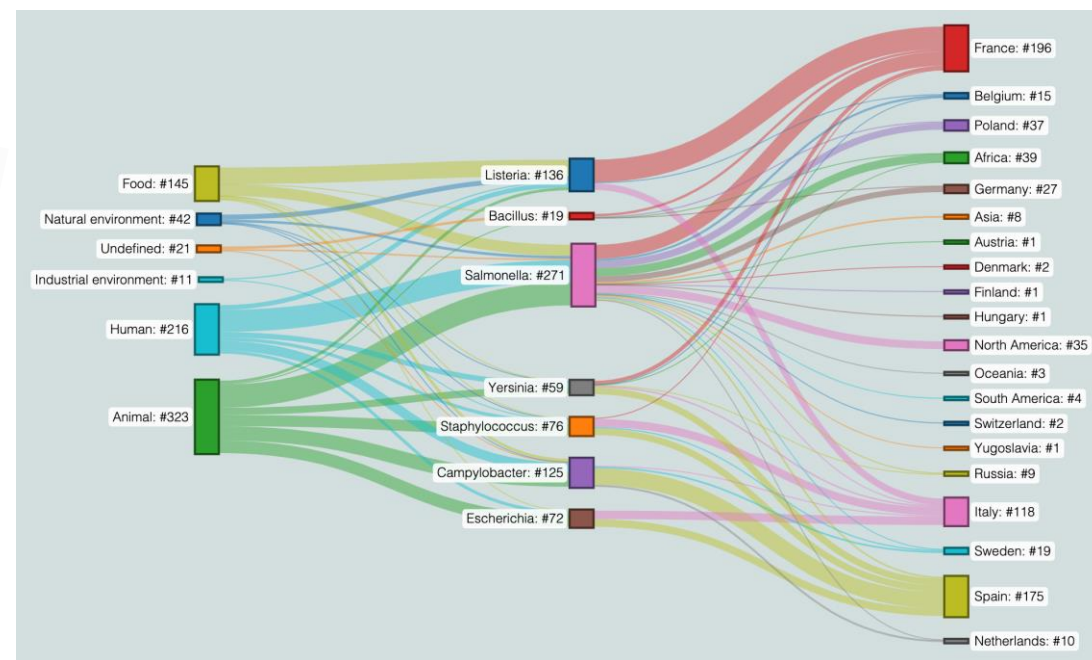
- *Listeria*
- *Escherichia*
- *Salmonella*
- *Yersinia*
- *Campylobacter*
- *Staphylococcus*
- *Bacillus*



5 sectors

594 strains

45 countries

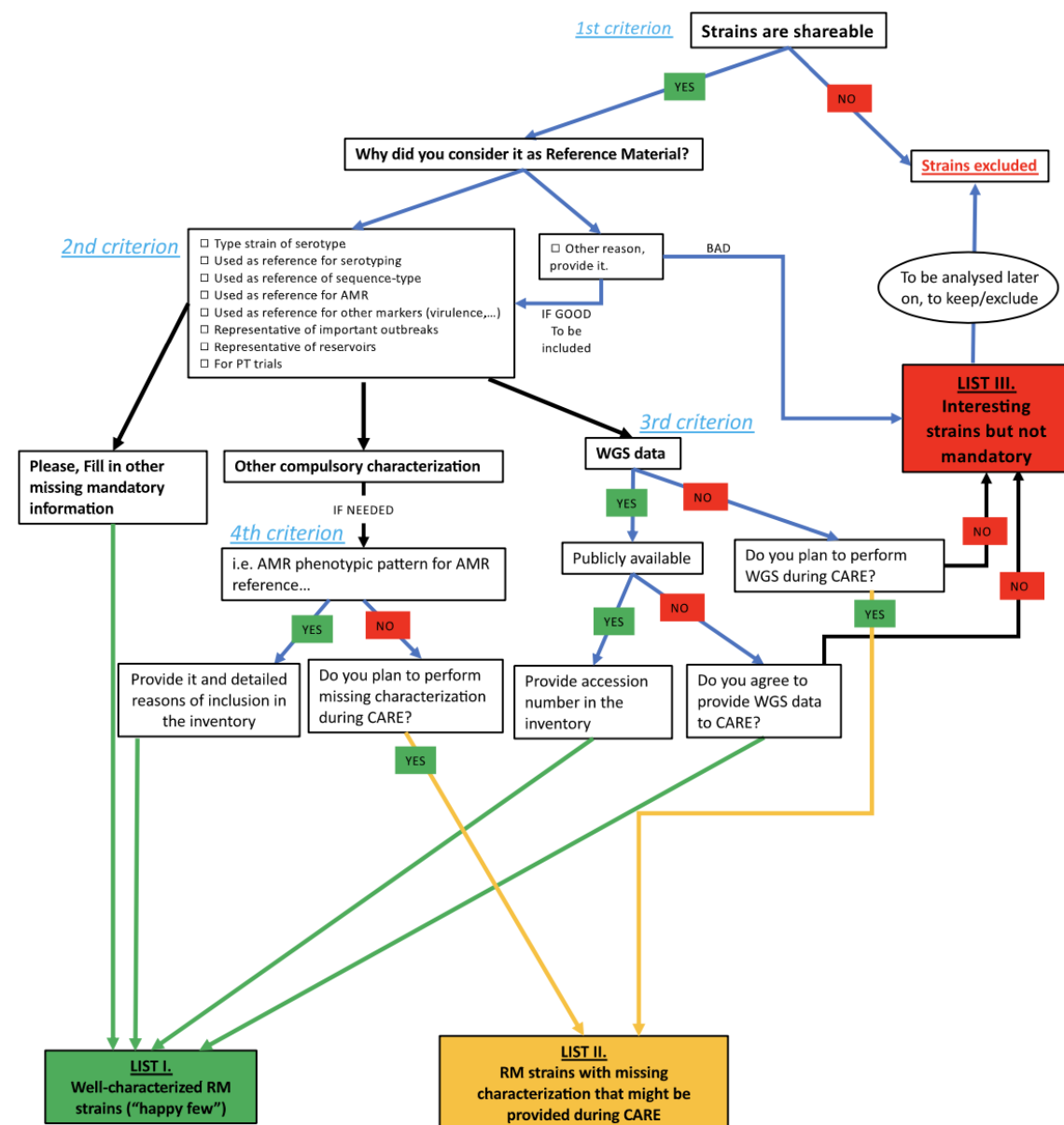


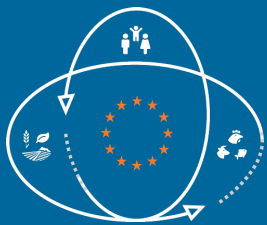


Inclusion of strains in the CARE collection

List of criteria

- Metadata
(country, sector, cultivation, ...)
- Food safety relevance
(representativeness, AMR patterns, outbreak)
- AMR phenotype
- WGS data
(predicted amr, virulence, ST, plasmid)
- Shareable





Providers of the CARE collection

15 institutes from 9 countries are contributing strains to the CARE collection



CARE training session on microbial collection management
PARIS (IP-CIP) – RENNES (CIRM-INRAE)
3-4 May 2022



Keepers of the CARE collection

Entrust the CARE collection to 3 Biological Reference Centres (BRCs)

CIP (IP) - BVR (IZSLER) - CIRM (INRAE)

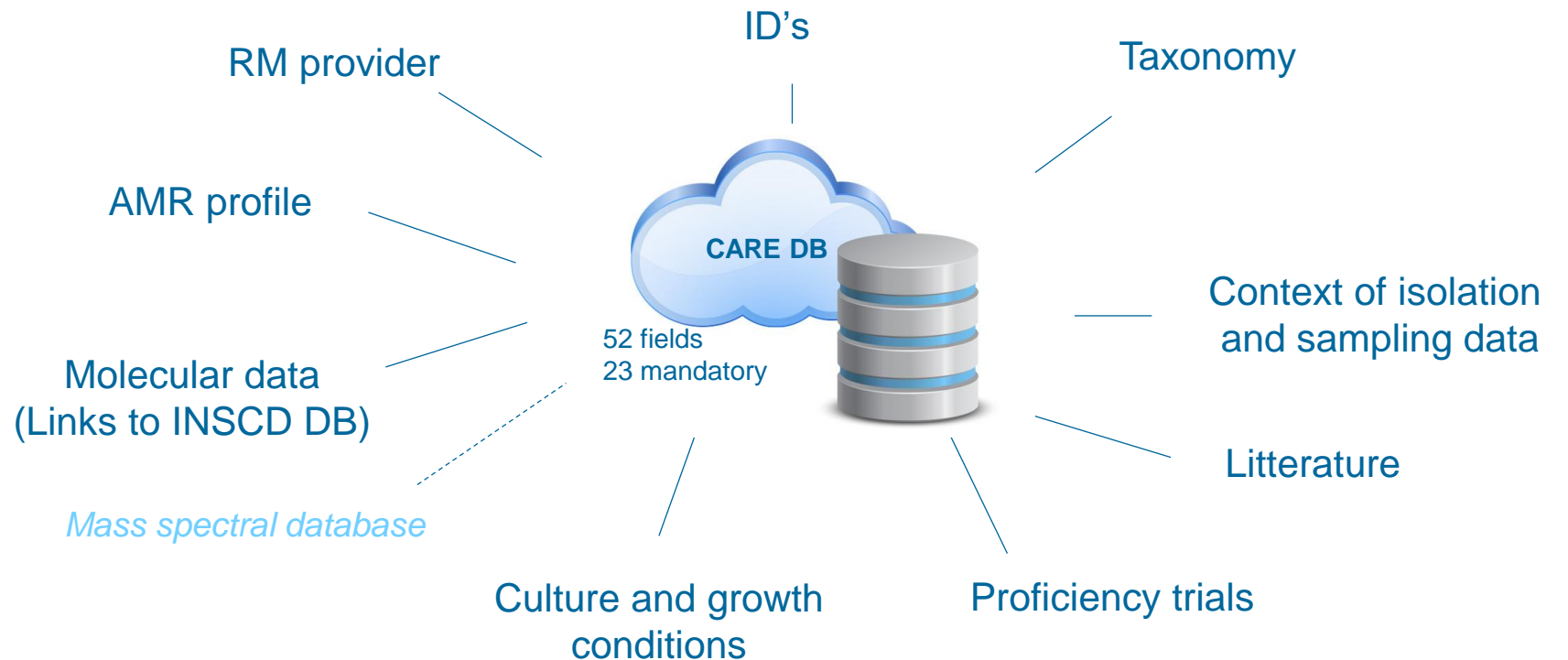
- Principles of operations of mBRCs: **Quality assurance** systems
- Compliance with **international regulation**
- **Sustainability**: Commitment of the 3 institutions to support their BRCs
- **Open Science**, a guarantee for the CARE collection future

- **MDAs** between mBRCs and strain providers / **MTAs** between mBRCs and strain users
- **Providers keep ownership** on strains for any kind of development that could have commercial value



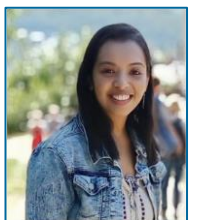
The CARE information system

Development of a dedicated database (Biologics)



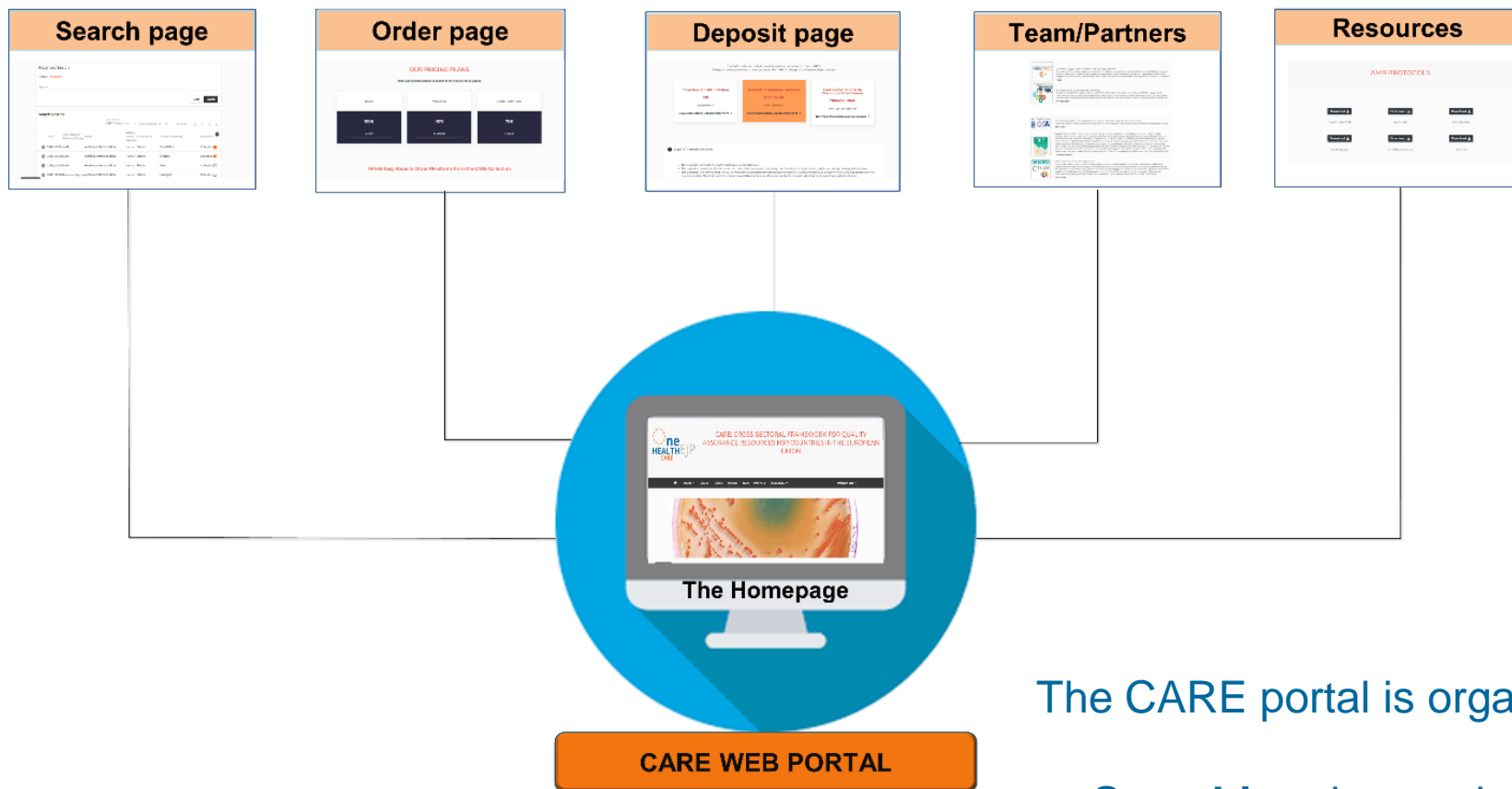
- ✓ Links to WGS raw data
- ✓ Date / location sampling / Sector of isolation
- ✓ Laboratory of origin
- ✓ Integration of predicted AMR / virulence genes
- ✓ Antibiograms data

Forum Shah





A rapid survey of the CARE portal



The CARE portal is organised around five entries:

- **Searching** the catalog by combining 9 fields: Species / country / sector / ST / serotype / AMR / Gene content / provider /
- **Deposit** strains (MDA)
- **Order** strains
- **CARE team**
- Documentary **Resources**

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Use of the CARE collection

Recent demands:

- Microbiological division of **world leading company**, provisioner of reagents, consumables and services to healthcare and life science: **20 *Salmonella* strains of the CARE collection**: *The Recipient is interested in the MATERIAL to lead researches for testing the **specificity and selectivity of methods under development** (e.g. inclusivity, exclusivity, and limit of detection study).*
- **Academic Research Unit: 20 *Campylobacter* strains of the CARE collection**
Research project on stress response of *Campylobacter jejuni*



Aknowledgement to the CARE WP2-WP3 partners

Who discussed in expert groups and shared information and strains



Coordination of the CARE project: Prof. Rene Hendriksen, DTU
WP2 lead: Dr Olivier Chesneau, IP

Thank you for your
attention!



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