ACGT on Cancer

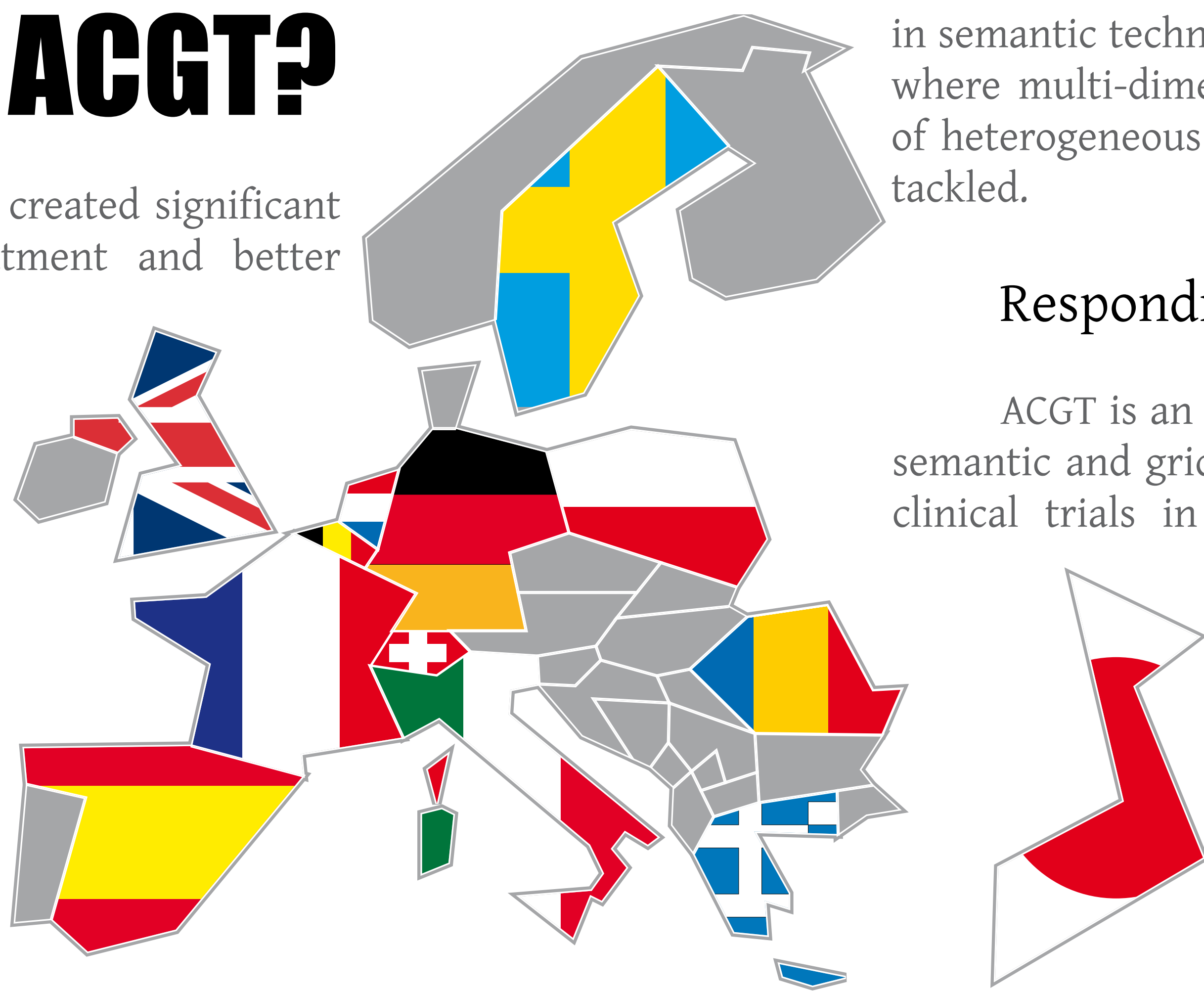*Advancing Clinico Genomic Trials*

Why do we need ACGT?

Advances in post genomic research have created significant opportunities for offering personalized treatment and better health care services to the population at large. At the same time new technologies in molecular biology are resulting in an exponential increase of information. This information is characterized by data heterogeneity which together with the lack of common infrastructures are preventing clinical research institutions from mining and analyzing disparate data sources to good effect. Clinical trials themselves have also become a bottleneck in terms of complexity, effectiveness and, in their present form, fitness for purpose. In the realm of information, technologies advances in semantic technologies and grid computing have reached a stage where multi-dimensional applications requiring the combination of heterogeneous data and software resources can be realistically tackled.

Responding to this challenge is possible today.

ACGT is an EU co-funded project that develops open-source, semantic and grid-based technologies in support of post genomic clinical trials in cancer research. It addresses clinicians, bio-researchers as well as software developers providing an open platform where novel and powerful services can be offered and put to use by practitioners in the field.

ACGT focuses on the integration of multilevel biomedical data including clinical data with the ultimate objective to extract new knowledge for developing more individualized treatments for cancer patients.
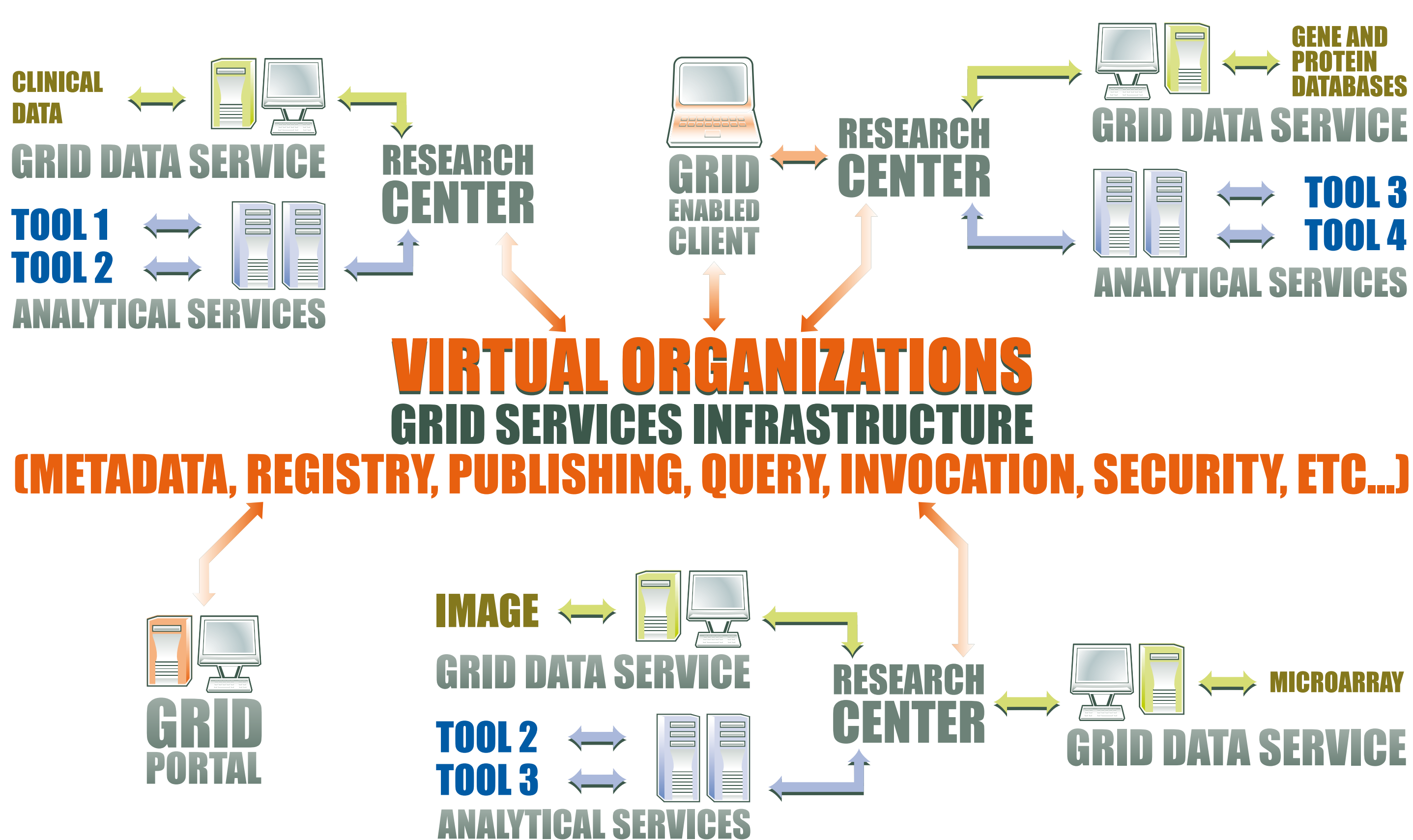
What will ACGT deliver?

• A set of resources to support clinical trial design and research

• Common standards of data storage and processing at each level of investigation

• Ontologies for cross-referencing terms and their biological contexts

• An easy to use workflow design and execution environment to support end-users in the exploratory, discovery- driven analytical tasks

• A biomedical GRID infrastructure offering seamless mediation services for sharing data and data-processing resources

Whom is ACGT for?

Medical Professionals: pick from a host of online easy-to-use tools that help you design and manage your clinical trials;

Researchers: access resources to support your experiments, analyze results, gain spatio-temporal insight into multilevel tumour biology;

Software Developers: develop state of the art services for clinical trial support and reach a host of users through the open ACGT environment

Patients: find interesting information on clinical trials, follow medical advances in cancer research or join a trial;

Regulatory Bodies: access resources that help streamline the approval process.

DATA FLOW

CLINICAL DATA

GRID DATA SERVICE

RESEARCH CENTER

TOOL 1
TOOL 2
ANALYTICAL SERVICES

GRID ENABLED CLIENT

RESEARCH CENTER

GENE AND PROTEIN DATABASES

GRID DATA SERVICE

TOOL 3
TOOL 4
ANALYTICAL SERVICES

VIRTUAL ORGANIZATIONS
GRID SERVICES INFRASTRUCTURE
(METADATA, REGISTRY, PUBLISHING, QUERY, INVOCATION, SECURITY, ETC...)

GRID PORTAL

IMAGE
GRID DATA SERVICE

TOOL 2
TOOL 3
ANALYTICAL SERVICES

RESEARCH CENTER

MICROARRAY
GRID DATA SERVICE

On the technical side...
ACGT will develop a unified technological infrastructure which will facilitate the seamless and secure access and analysis, of multi-level clinical and genomic data enriched with high-performing knowledge discovery and multiscale simulation operations and services in support of multi-centric, post-genomic clinical trials.

Diseases Covered

• Wilms Tumor
• Breast Cancer
and more to come...

In Silico Oncology
In Silico Oncology creates multilevel computer models of tumour growth and its response to treatments. The «Oncosimulator» tool that is being developed will assist clinicians and other practitioners better understand disease progression and hopefully design more personalized treatments for patients following its strict clinical validation .

Legal and Ethical Aspects
Multi-level clinical trials have to deal with sensitive personal data. ACGT is fully aware of the legal, technical and ethical implications of the research done in the project. Significant resources are therefore spent to guarantee (more than) compliance with the relevant European regulations. The legal, ethical and security framework defined in ACGT is open for use by any similar project.