

ArMet Documentation

1. Home

1.1. ArMet - an Architecture for Metabolomics

This site provides information about ArMet, the data model for plant metabolomics developed at the [University of Wales, Aberystwyth, UK](#).

The ArMet development team at Aberystwyth is responsible for the development and dissemination of the ArMet core and for co-ordinating the development and dissemination of standard sub-components. Please [contact us](#) if you have any feedback or comments or if you wish to contribute to this initiative.

1.1.1. News

2005-05-12 The [Plant Physiology paper](#) has appeared.

2004-12-06 The [NBT paper](#) has appeared.

2005-02-14 Comment in the [Journal of Proteome Research 4\(1\):20](#)

1.2. Aims

ArMet is a framework for the description of plant metabolomics experiments and their results. As such it facilitates the development of systems for the storage and dissemination of plant metabolomics experimental data and provides a starting point for the development of community data standards for the metabolomics community, much as [MIAME](#) has done for the microarray community and [Pedro](#) and [HUPO PSI](#) are doing for the proteomics community.

1.3. Structure

ArMet encompasses the entire timeline of a plant metabolomics experiment. It comprises nine components each of which describes part of the overall process of an experiment by way of a core set of data items. These items are relevant to all plant metabolomics experiments and serve as a minimal description for each component. In addition to the minimal core

description, each component will have zero, one or more alternative descriptions (sub-components) that support the core data plus additional data to describe particular methodologies and/or technologies in more detail. The ability to define these detailed sub-components means that the architecture may provide specific support to particular projects, experiments or laboratories whilst maintaining the comparability of datasets from different origins by way of the core data. In addition the component-based approach enables customisations of the complete architecture to be defined. Such customisations allow the different personnel involved in a plant metabolomics experiment to be presented with the part of the overall architecture that is relevant to them. A number of these customisations may then be integrated to provide the complete architecture for a particular project.

1.4. Development

We put ArMet forward as a basis for community discussion. We welcome feedback on the current design and its applicability to metabolomics experiments carried out in different fields. We also welcome suggestions for collaboration in defining new sub-components to accommodate particular experimental techniques and technologies.

We expect to run workshops to discuss development.

Please [contact us](#) for further information.

2. This Site

2.1. History of Changes

[RSS](#)

2.1.1. Version 1.0 (2004-11-03)

- Release of new design (NWH)

2.1.2. Version 0.1 (2004-08-12)

- Initial Import (NWH)

2.2. Todo List

2.2.1. high

2.3. Site Feedback

If you wish to provide us with feedback on these pages please contact [Helen Jenkins](#) who maintains them.

3. Publications

3.1. Publications

3.1.1. Journal Papers

- **"Towards supportive data collection tools for plant metabolomics"**. Helen Jenkins, Helen Johnson, Baldeep Kular, Trevor Wang, Nigel Hardy
Plant Physiology **138**:67-77
- **"A proposed framework for the description of plant metabolomics experiments and their results"**. Helen Jenkins, Nigel Hardy, Manfred Beckmann, John Draper, Aileen R Smith, Janet Taylor, Oliver Fiehn, Royston Goodacre, Raoul J Bino, Robert Hall, Joachim Kopka, Geoffrey A Lane, B Markus Lange, Jang R Liu, Pedro Mendes, Basil J Nikolau, Stephen G Oliver, Norman W Paton, Sue Rhee, Ute Roessner-Tunali, Kazuki Saito, Jørn Smedsgaard, Lloyd W Sumner, Trevor Wang, Sean Walsh, Eve Syrkin Wurtele & Douglas B Kell
Nature Biotechnology **22**(12):1601-1606 (2004) Dec. [Publisher's Link](#)

3.1.2. Posters

Two posters were presented at the [2nd International Conference on Plant Metabolomics](#):

- *Towards a standard representation of metabolomics experiments and their results: ArMet* ([PDF](#), [PowerPoint](#))
- *Proposal for a Standard Representation of the Results of GC-MS Analysis: A Module for ArMet* ([PDF](#), [PowerPoint](#))

4. Specifications

4.1. The Core Specification

The ArMet core specification is currently at version 3.1.

The core specification exists as a design document. This document is provided here, together with an XMI version of the UML data model that it describes.

- ArMet Design (Version 3.1), [PDF Microsoft® Word](#)
- ArMet Design XMI (Version 3.1) [.zip](#)

4.2. A Sub-Component for GC-MS

The GC-MS sub-component specification is currently at version 2.1.

The sub-component specification exists as a design document which is provided here.

- ArMet Sub-Component Design: GC-MS (Version 2.1) [PDF, Microsoft® Word](#)

4.3. Controlled vocabularies

As described in the design, controlled vocabularies are required to govern the valid values that may be provided for some of the data fields in implementations of ArMet. These data fields have a complex type that requires a value, authority pair where the authority identifies the ontology/controlled vocabulary from which the value was taken. These authorities may range from publicly available recognised ontologies (e.g. www.plantontology.org) to the local list of terms for a laboratory. Ongoing work to implement a database that conforms to, and provides sub-components for, the ArMet core for recording metabolomics experiments involving *Arabidopsis thaliana* and *Solanum tuberosum* has, to date, involved the definition of local vocabularies to control input to development stage, tissue type, type of lighting, container type and growth medium fields. These vocabularies are provided here as examples.

- Controlled Vocabulary Examples [PDF, Microsoft® Word](#)

5. Implementations

5.1. Implementations for Download

ArMet design v.3.1 has been translated into SQL and XML and these implementations are provided here as examples.

- ArMet Core SQL [.zip](#)
- ArMet Core XML [.zip](#)

In addition to these complete core implementations an example customisation of ArMet has been developed. This customisation is for use by experiment personnel involved in the growth and harvest of plants in a controlled growth environment. Below you may download a document describing the customisation and the Microsoft® Access database implementation.

- ArMet Example Customisation (documentation) [PDF, Microsoft® Word](#)
- ArMet Example Customisation (database) [.zip](#)

5.2. Online Implementations

There are currently two project-specific Oracle9i implementations of the ArMet core that are being developed and maintained by the ArMet development team. Both of these implementations have web-based front-ends developed using Oracle9i Forms Developer. Click below to access these implementations. Due to issues of data ownership, both sites are password protected.

- ArMet for the UK Food Standards Agency [G02006](#) project.
- ArMet for the UK BBSRC [HiMet](#) project.

6. Contact

6.1. Contact details

6.1.1. ArMet Feedback

The ArMet development team at the University of Wales, Aberystwyth are responsible for the development and dissemination of the ArMet core and for co-ordinating the development and dissemination of standard sub-components.

If you wish to:

- provide us with feedback on the ArMet core specification, propose alterations to its design or tell us about errors;
- provide standard sub-components for dissemination or propose ideas for collaboration in developing them;
- query how ArMet may help you in your work or pose any other related questions;
- find out about meetings to discuss ArMet;

then please [e-mail](#).

6.1.2. Site Feedback

[Link](#)