

## Evaluation Report – Swedish NMR Centre, Gothenburg

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Overall, the committee has been highly impressed by the quality of the RI, both in terms of instrumental set-up, and in terms of high-level expertise of the staff and services developed for its local and national users. The visit was organized with a significant amount of time dedicated to direct exchanges with the users, who provided positive feedback, and showed a very high level of satisfaction with respect to the RI. In particular, all users, from all fields, unanimously recognized the positive development of the facility over the past few years, both in terms of quality and reliability of instrumentation, support and expertise in new fields.

### Addressing evaluation criteria:

- How have the criteria for Research Infrastructure at University of Gothenburg been met?

All criteria and rules for a University-Wide RI have been followed:

- the RI shows a broad user base of independent users, going well beyond the borders of GU and the country;
- the RI has a capability both for basic service and for support to advanced NMR-based projects in diverse areas of science;
- the RI has received very significant support from National funding (currently secured until 2020) and is unique in Sweden. It stands as the largest NMR Centre in the whole Scandinavia. The infrastructure is very well set-up, and has an international standing in terms critical size, quality, and expertise.

- How have the rules for Research Infrastructure at University of Gothenburg been followed?

All rules for RI at the University of Gothenburg have been properly followed, and a proper management structure for the RI is established.

- How have the activities been developing?

Earlier evaluations (2013-14) raised concerns regarding the quality of equipment, diversity of the use, openness of the infrastructure to Users from different communities (specifically outside Structural Biology), and interactions with emerging fields of research.

A very clear and strong progress in all these directions is noted by the evaluation committee, and acknowledged by all parties involved in the RI. Very significant efforts have been made by the NMR facility to develop towards new areas of applications, with successful output: metabolomics, chemical biology, materials science and small molecules. These developments are quite well embedded with the Research developed at the different Faculties at GU and Chalmers, with a strong and diverse base of local users and very fruitful collaborative efforts with the Users to develop methods and applications relevant to their needs. Overall, activities have been developing very well.

- What added value does the University of Gothenburg receive from the Swedish NMR Centre being part of Swedstruct and SciLifeLab?

The RI is important for structural biology in Sweden, and therefore was an essential part of Swedstruct. Swedstruct enabled Swedish researchers to participate in all activities of ESFRI Instruct and facilitated international access to the Swedish NMR Centre at GU. Unfortunately, Swedstruct does not exist anymore. Belonging to structures like Swedstruct and SciLifeLab defines the quality and international standing of the infrastructure. SciLifeLab provides a national recognition and financial support, and creates extra feasibility between SciLifeLabs. As such, it contributes to Outreach and development of the National and International impact of the RI.

- Does the mission of the NMR Centre formulated by the faculty fit the purpose? If not, how should it be modified?

The mission of the NMR Centre as it was formulated a few years ago fits the purpose and has driven the development of the RI in relevant directions to fulfill the needs of the Scientific Community, and to establish a visible and recognized infrastructure at the international level.

- How well does the organizational structure fulfil its purposes?

The organizational and steering structure is fully operational and provides an adequate level of operational and strategic management. New local experts (Björn Burmann) should replace the empty seats in the steering committee, and the industrial seat should be also re-filled.

A decision to an organisational transition of the NMR Centre to a Departemental level should not be taken in rash. The activities at the Centre reach various Faculties and Departments at GU and other universities in Sweden, and independence of the structure in terms of budget, with respect to Research departments, is key for long-term sustainability of such an interdisciplinary structure. It is suggested to investigate the Facility setup of large centers at other institutions, such as at the Medical Faculty of GU.

- How have the specified technical, scientific and administrative development areas been developed?

The level of technical and scientific support provided to the users has tremendously developed over the past few years with the recruitment of several staff scientists with complementary expertise. Major technical upgrades to the infrastructure have been made (UPS, liquid nitrogen supply, helium recovery system, and magnetic field compensation system), which provides the highest level of technical infrastructure for high-field NMR, with few equivalents elsewhere in Europe.

At the administrative level, suitable communication procedures between the RI and its steering committee, as well as consortium agreements with U. Umeå and SciLifeLab have been well established.

- How have the infrastructure's routines been developed?

Suitable routines for monitoring performance of the NMR equipment, rules and procedures for facility access, monitoring of facility activity, users training, data exchange with users and projects follow up have been put in place.

- How does access and utilization of the research infrastructure look like with regard to gender?

Access and utilization of the RI looks very well balanced in terms of gender issue. This very good balance is noticed both on the side of the RI staff team, and the user base.

#### Other remarks and recommendations by the Evaluation Committee:

- Enhancing visibility of the NMR Centre:

Outreach in the past has very effectively attracted new users but also new communities to the RI. The prospective work from the facility has been strongly based on raising awareness about instrumentation, and possible new domains of applications (in line with the priorities set by the Faculty). For future developments, the RI and GU could further capitalize on the results and science that has been produced by the facility, by illustrating and advertising scientific highlights for the different thematic domains defined in the RI roadmap.

- Research at Facilities:

The evaluators are well aware that the NMR Centre makes significant and well appreciated contributions and developments to international research, as can be expected from advanced RIs. However, a clear overview of research activities in the past period was not part of the supplied materials. We advise that the focus when reporting activity of the RI should in the future include a broader assessment of the quality of the output, highlight significant scientific results, as well as the contribution of the RI to the quality of Research at GU and beyond.

- Regarding the scientific support team of the RI:

Individual expertise and contributions of the staff scientists are highly appreciated and well recognized by the Users. The team is encouraged to keep developing a high quality of interaction and trustful relationship with the Users to accommodate the diverse levels of expertise and the needs from the community that range from non-NMR scientist, to independent expert Users. Presentations and participation at international conferences and workshops of the staff scientists have contributed to the international visibility of the RI over the past few years. It also contributes to an essential scientific emulation and high-level training for the staff, and should be continuously encouraged in the future. Such activity (posters, oral presentations by staff scientists) should be documented in activity reports in the future.

- Leadership of the RI:

The evaluation committee would like to specifically congratulate Göran Karlsson, who as a Director of the Facility has really positively driven the development of the RI, and built a young and strong team with recruitment of excellent staff who work in a positive atmosphere. His individual quality as an entrepreneur for the RI has been stressed by a large number of Users.

- Regarding future developments of the instrumental capacity:

The facility currently has a large instrumental capacity, with still room for exploiting further the potential of the RI in terms of quantity of access. The RI is fully dimensioned for fulfilling the needs and developments of the activity of the local PIs, but also to welcome additional teams at GU with NMR-based research, which would complement the available expertise and consolidate the long-term sustainability and optimal use of the medium-field range of NMR instruments.

Future investments should be driven by the need of Users, and even further than this include their major commitment, both operational and in terms of funding (meaning investment or co-investment) and associated research developments (e.g. very fast MAS solid-state NMR). Any further high-end development in the direction of SS-NMR should come from a concerted effort of Umeå and Gothenburg.