

RESEARCH REVIEW  
SWAMMERDAM INSTITUTE  
FOR LIFE SCIENCES  
2017-2022

UNIVERSITY OF AMSTERDAM

De Onderzoekerij  
Vondellaan 58  
2332 AH Leiden

Email: [info@onderzoekerij.nl](mailto:info@onderzoekerij.nl)  
Internet: [www.onderzoekerij.nl](http://www.onderzoekerij.nl)



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## Preface

The Swammerdam Institute for Life Sciences (SILS) is part of the Faculty of Science of the University of Amsterdam. It has a complex history with an attempted merge with the Biology Faculty of the Free University of Amsterdam. It was restructured after this merge failed and is now a major research and education department in the university. SILS is involved in many education tracks and critical for the Science Faculty. SILS harbours four research themes: Cell & Systems Biology, Neurosciences, Microbiology and Green Life Sciences. The site visit committee has discussed science, education and many other topics with the SILS management board, the different themes, PhD candidate committee, early career staff, valorisation committee, diversity and inclusion policy committee and the technicians. These were open discussions that gave the site visit committee a thorough insight in the ambitions, structure, innovation and more of SILS. The spirit in SILS is optimistic (the phrase ‘a lot is changing...’ was often heard) and many initiatives have started to foster young talent and develop highly competitive research programmes. During the open discussions, the board also developed some concepts to support the initiatives across the different themes within SILS. The committee hopes that these will further support the development of SILS towards an internationally leading research institute.



## 1. Introduction

### 1.1 Aim of the assessment

All publicly funded university research in the Netherlands is evaluated at regular intervals in compliance with a national strategy evaluation protocol (SEP 2021-2027), as agreed by the Universities of the Netherlands (UNL), the Netherlands Organisation for Scientific Research (NWO) and the Royal Netherlands Academy of Arts and Sciences (KNAW). The evaluation process, which is applied at the research unit level, consists of an external peer review conducted every six years.

The site visit committee (hereafter: committee) is requested to assess the quality of research conducted by the Swammerdam Institute for Life Sciences (SILS) and its four research themes:

- Cell & Systems Biology
- Neurosciences
- Microbiology
- Green Life Sciences

as well as to offer recommendations to improve the quality of research and the strategy of SILS.

This report describes the findings, conclusions, and recommendations of this external assessment of the research of SILS.

### 1.2 The committee

The Board of the UvA appointed the following members of the committee:

- Colin Hill, Professor of Microbial Food Safety in the School of Microbiology, University College Cork
- Marloes Henckens, Associate professor of Neuroscience, Radboudumc
- Anthony Holtmaat, Professor of Neuroscience, Department of Basic Neurosciences at the University of Geneva, and the Geneva University Neurocenter
- Jacques Neefjes (chair), Professor of Chemical Immunology, Leiden University Medical Center
- Roan van Scheppingen, PhD candidate, Netherlands Cancer Institute
- Marja Timmermans, Professor in Developmental Genetics, Center for Plant Molecular Biology, University of Tuebingen

The university board appointed Annemarie Venemans of De Onderzoekerij as the committee secretary. All committee members signed a declaration form stating no conflict of interest and ensuring impartiality and confidentiality.

### 1.3 Procedures followed by the committee

Before the site visit, the committee reviewed detailed documentation comprising the self-assessment report of the institute including appendices, the midterm report, and previous SEP assessment report.

The committee proceeded according to the Strategy Evaluation Protocol (SEP) 2021-2027. The assessment was based on the documentation provided by SILS and the interviews with their



management, selections of senior and junior researchers, PhD candidate as well as technician representatives. The interviews took place on June 15-16, 2023 (see Appendix A).

The committee discussed its assessment at its final session during the site visit. Based on written input of the committee members, the secretary compiled a report. The committee members commented by email on the draft report. The draft version was then presented to the institute for factual corrections and comments. Subsequently, the text was finalised and presented to the Board of the university.



## 2. Assessment of the research of SILS

### 2.1 Management, organisation and strategy

The mission of the Swammerdam Institute for Life Sciences (SILS) is to provide a broad science and technology platform, allowing research in many disciplines and fostering interdisciplinary research. The overall mission is loosely stated as “train a new generation of life sciences researchers, thereby delivering excellent human capital for (future) societies”, which is an objective that mainly focuses on education. Yet, science is an important activity of SILS and is represented in four research themes. The four themes (Cell & Systems Biology, Neurosciences, Microbiology and Green Life Sciences) illustrate the broad scope of activities within SILS. This is important as SILS is involved in running various education programmes within the university.

Restructuring of the research within SILS became effective in 2018, which included theme clustering based on scientific synergies (four research themes). The four research themes are represented in the MT. The new management structures have been put in place and are functional – resulting in coherence and transparency. The new SILS director has installed a Scientific Advisory Board (SAB) in 2021, which was involved in the midterm evaluation 2021. The SAB has been immediately put into action, and this has resulted in important recommendations in terms of the research and management structures.

The management of SILS is more complicated than that of a uniform research institute, yet the committee was pleased to note a series of steps taken by the current MT to improve science but also to improve societal security, educational programmes and more. The instalment of a functional SAB that is involved in decisions related to future research is an important step, as a considerable number of staff will retire in the coming years. This will create opportunities but will also require ‘smart and timely’ investments into future talent that (hopefully) will bring in prestigious individual career (e.g., ERC and VENI/VIDI/VICI) grants. An UvA broad support office for grant writing is in place but an explicit approach to support the conceptualisation of competitive and original ideas for such grants is lacking. The committee suggests the following actions:

- Install a mentoring programme where young group leaders are teamed up with a senior scientist outside the theme, whose role is to challenge and support the formulation of such competitive concepts for these types of grants.
- Install perspective meetings for all SILS members where the future aims and goals of the SILS are presented and discussed, followed by a SWOT analysis. This should be repeated at regular intervals for new hires.

Proper investment in the future of SILS is timely and critical considering the retirement of various senior group leaders. Now is also the time to consider the topics within and between themes, which can lead to more integrated research activities within SILS. It is important that the early career staff members are fully involved in this discussion as they are the key contributors to the research in this domain, today and in the future.

In this light, the committee asked the different theme members, but also the technicians and PhD candidates whether they could succinctly formulate a SILS mission or vision. The prevalent response alluded to the broad science opportunities with the option of interdisciplinary research. When discussing this with the different themes, the committee noted that the options within SILS were suboptimally used and that most groups performed science within their group or within their theme. The committee noted that:





- SILS could introduce cross-over meetings mandatory for group leaders and as part of the training of PhD candidates (so also obligatory).
- SILS could install a ‘meeting the other groups’ training for PhD candidates where they are visiting the groups in the other themes. If they were to visit each group for one day, visiting of the themes would only take three days in total. It should be the responsibility of the hosting groups to provide an interesting programme. This bottom-up approach would increase cross-over knowledge of the activities and technologies in the other themes.
- It would be beneficial for SILS to formulate and codify a mission statement, or vision statement, that could provide individuals within SILS with a common identity and purpose.

The committee was frequently confronted with the argument that career grant success and research performance were compromised by the serious teaching load. There are group leaders with a 50% and with a 30% teaching load. The 50% teaching load may indeed result in a disadvantage when it comes to producing the scientific basis for a competitive grant. The committee discussed this at great length. One option would be to:

- Invest in young faculty/talent by reducing the teaching load significantly for an initial period to allow individuals to build up a competitive position for grants. This advice has already been implemented in the GLS theme with success. It can generate a momentum in their research programmes since successful career grantees often continue to be competitive later in their careers. This implies a higher teaching load for other SILS members, but investing this way in young faculty pays back and will certainly improve the international standing of SILS.

The standing of SILS within the Science Faculty of UvA is high, but they may not always be equally appreciated as (often smaller) activities within the Science Faculty. The funding for labs required for experimental research and education in life sciences appears disproportionately low when compared to other faculties that require -for example- only computer or office space. This is also the case for the green house, which is critical for research and education within the faculty but relatively expensive per square meter. SILS plays a vital role in the delivery of many research and educational programmes and has a pivotal function in many (multidisciplinary) research endeavours, centres and networks in Amsterdam, The Netherlands and Europe. The committee feels that the Science Faculty should be proud of SILS and support its research and educational opportunities, accordingly, accepting and awarding the fact that experimental research in life sciences involves more expensive lab space.

## 2.2 Research quality

The size of the four different themes is rather variable, ranging from a total staff of around 21 FTE (Microbiology) to 68.8 FTE (Neurosciences) in 2022. Also, the number of groups within the different themes varies. The research is of a high quality with some groups acting at an internationally leading position, while others are nationally leading or internationally following as also reflected in their Field-Weighted Citation Impact (FWCI), as discussed in detail in the evaluation of the individual themes. SILS publishes many important papers and contributes to the international science community by generating important knowledge and new methodologies. Method development is in part provided by the underpinning technologies of SILS (clustered along three main types of technology: Microscopy, Mass Spec, and Omics). The strategy to structure and organize these technologies into platforms has been successful, mostly for the groups that have these technologies at their core interest (i.e., Microbiology and Cell & Systems Biology), but also offers a strong base for increasing collaborative efforts within SILS.

The committee highly enjoyed the interactions with the different themes (see later) but was somewhat disappointed by the number of successful career grants (e.g., VENI/VIDI/VICI and ERC) that have been



obtained over the last six years. This year (after the SILS site visit), SILS received three (!) VIDI grants in two themes and SILS has to be congratulated with this success. Still, other young group leaders could be better supported and stimulated to try to obtain such grants as well (see under 2.1, research management), but that also requires leadership within the themes. The committee noted that:

- The organisation of the different themes within SILS varies greatly. It advises appointing a ‘theme leader’ who has several defined tasks such as integrating research within the theme, activating group leaders to search for opportunities in the other themes and to establish a support programme for young faculty aimed at increasing success at these career grants.

Increasing the uniformity of the themes’ organisational structure and by introducing defined leadership roles therein, will support SILS overall and induce a dynamic culture of science and education.

### 2.3 Societal relevance

SILS is highly active in outreach activities with a high societal relevance such as the Center for Urban Mental Health and Amsterdam Green Campus. These are excellent activities to support education and understanding of science for the public. The beautiful SILS website showcases and supports these activities, all very well visible to the public. Technical tool development such as the fluorescent probes are important for the broader scientific communities and are shared. In addition, SILS members are proactive in public debates and patient organisations. Altogether, SILS researchers are involved in a variety of scientific and outreach activities through which they achieve a very high return of societal investment. The education programmes are obviously foremost important for students, but this also translates into societal relevance. These activities are outstanding. The Green Life Sciences theme is also highlighted for academic collaborations with industry.

However, the committee is of the opinion that the valorisation of the research is very project- and PI-dependent and is not integrated into the policies of SILS. It seems to be largely left to the individual scholar to take the initiative or to respond positively to, for instance, media requests. SILS seems to lack a clear policy or strategy related to societal dialogue. The committee considers that a more systematic approach would allow SILS to perform better in impact, public engagement and uptake of its research. Such an approach would include incentives for its research staff as recognition for their time-consuming efforts to increase public outreach.

### 2.4 Viability

As discussed above, SILS is a very good life sciences research institute but has some fragilities. The number of successful applications to prestigious career grants should be increased (and has been with three VIDI grants in 2023) and this requires strategy and leadership. In addition, young faculty staff should be protected from a severe teaching load in return for building up a viable research line that then should also translate in successful grant applications. This then facilitates the recruitment of talented PhD candidates and postdocs, which in turn would provide additional funding for SILS. In other words, even from an economical point of view, this would be an important investment.

SILS should strategically invest in new groups and research directions in order to move to more cross-disciplinary activities between the different themes. The recent instalment of an SAB with excellent scientists that help in these types of strategic decisions, has been an important step.

The committee also felt that perhaps the constitution of the groups should be more flexible. It noted the high (and fixed) number of permanent technicians in each group/theme. Notwithstanding that these



members of staff are happy within the current SILS structures, dynamically appointing technical assistance to groups according to needs (e.g., a shift in technical support from a shrinking group to a growing group) could be considered, if the required technical expertise overlaps.

## 2.5 Working environment and personnel policies

The atmosphere at SILS is excellent. The committee also noted the enthusiasm about the dynamics and leadership of the director. The director is easily approachable and open to one's opinion and input, trying to create a pleasurable and stimulating work environment. This clearly translates in an excellent academic culture.

Below some specific points.

### *Open science*

SILS shows a strong involvement in open science. Papers appear in BioRxiv and are thereby publicly available before appearing in other journals. A paper in BioRxiv is considered as a publication (e.g., for evaluation and promotion), which aligns with the policies in most international life science institutions and public funding agencies. There is awareness within SILS management that a focus on the publication count rather than the impact of the work, in the landscape of open science dissemination, might drive researchers to publish in predatory journals, and that this needs to be avoided.

### *Safety*

The committee has evaluated the structures in place. There is a Faculty ombudsperson and SILS has a confidant that people can go to, but this was not generally known to students and others within SILS. It would be advised to make this clearer to PhD candidates and post-docs, for example by mentioning these people specifically on an information sheet which new PhD candidates, post-docs and staff members receive when starting at SILS.

### *Work pressure*

Many members of SILS have a significant teaching load that is only compensated by the enthusiasm of the staff. Little time left for research gives staff members less opportunity to establish themselves as internationally leading researchers in their field. Yet, this is a complicated balance as one theme (Neurosciences) has chosen for a more intense teaching load in return for staff and PhD positions. If used wisely, these positions may also be used to perform research as a basis for grant applications.

Still, the committee is of the opinion that the research time could be enhanced. It realises that the institute cannot grant all members the research time it would wish. The committee is pleased that the SILS management is planning to distribute the teaching loads more evenly in SILS by making and adjusting a yearly deployment planning. As discussed in section 2.1 the committee advises the institute to consider a temporary limitation in teaching load for early career staff. Another possibility would be to create mechanisms to allow faculty to concentrate their teaching into shorter periods within each teaching term (e.g., by teaching only during the first or second semester). This would allow more time for focused research activities. Since teaching duties/hours are strongly linked to individual staff members, there might be some redundancy or overlap in the programmes (at the master's level, which is subdivided over groups). This imposes the risk that some teaching activities are duplicated, which should be carefully evaluated.



*HR-policies*

Following the initiative of the Faculty, SILS started implementing new university HR policies regarding promotion criteria and procedures for scientific staff. This should lead to clear career development plans and trajectories, including possibilities for promotions to full professor. The committee is positive about the improvements SILS has made in this regard. However, some of the staff members indicated that although these criteria have been put on paper, steps still need to be taken towards their straightforward, unambiguous implementation in practice, e.g., by formulating them more specifically. Moreover, with the transition towards 'Erkennen en Waarderen', the diverse aspects of a scientific career should be equally appreciated, and extraordinary efforts and accomplishments in one domain should be able to partially compensate potential shortcomings in another.

*Diversity*

At the level of assistant professors, the male/female balance is approximately 70/30 while at associate professor level, this is approximately 60/40. The biggest gender imbalance is at the full professor level (90/10).

The institute stated that they attempted to hire a female professor, but without success. According to the committee, more concrete action is needed to further improve gender balance and diversity and to create a working environment that generally promotes diversity. Further emphasis on the awareness and improved insight into discriminatory mechanisms in academic environments and how to consciously counteract them would facilitate this. The committee suggests for the MT to formulate clear targets for future hires aiming at the reduction of the extreme gender imbalance at the full professor level. Setting this as a priority, acknowledging the additive value of diversity at all levels of seniority, might require more flexibility in the type of appointments for women that are at different career stages, as well as explicit investments in existing staff to make sure they reach full potential.

The committee is positive about the start of a diversity and inclusion policy committee. However, this committee appeared unsure about their position in the organisation chart and would like to have scheduled meetings with the director to propose activities in this context, and to convey feedback from staff and students. Also, the committee sees a particularly important role for the diversity and inclusion policy committee in the hiring of new faculty, which should start at the stage of formulating recruitment texts, but also involvement of the committee members in the further selection procedure.

In addition, the committee would like to point out that diversity, equity and inclusion, entails more than gender. While the self-evaluation discusses gender, other diversity benchmarks were not brought under attention. With the help of the diversity and inclusion committee, other minorities can be identified, and active policy or training can be used to improve diversity at SILS.

**2.6 PhD programme**

Overall, PhD candidates involved in the different research themes are satisfied with the level of supervision and training they receive from their respective supervisors. PhD candidates feel connected and are mostly in touch with PhDs within their theme. There are multiple events to further strengthen connections between PhD candidates of different themes, which is a good initiative.

PhD candidates are involved in teaching, but their teaching duties vary and range from supervision of a bachelor or master internship to more extensive teaching (PhD+ that can take one additional year



before graduation as compensation). In general, PhDs have a good understanding of the expectations regarding teaching and have the feeling that this is balanced.

The university and the Faculty of Science provide several courses on general topics. The research themes are involved in different graduate schools with more on-topic themes, such as Neurobiology or Plant Sciences. Other themes do not have a (specific) graduate school. Association with theme-specific national graduate schools makes sense for content and on-topic collaborations. However, this does not help with the creation of synergy within SILS. A SILS graduate school for some general activities (leadership, how to write a grant, how to present etc) is advised.

A theme which is discussed more often in society, is mental health. This is closely related to efforts to increase awareness of diversity and inclusion. SILS PhD candidates express the need for more support and information regarding mental health. The committee envisions increased visibility of the confidential advisors, personal mentorship beyond scientific development and, again, active policy to improve mental health. In addition, an independent, scientific mentor should be installed to whom students can turn to in case of personal conflict.

Currently, the average SILS PhD takes about 60 months and SILS has put in place measures to reduce the average completion time to the standard 48 months. SILS has created, together with PhD candidates, clear guidelines on thesis completion and what entails a booklet. Further, SILS restructured the PhD supervisory committee meetings to allow more in-depth discussion of research plans rather than scientific and educational progress alone.

However, during the site visit, it became clear that PhD candidates experience pressure related to finishing their PhD within the predetermined time frame. The pressure stems predominantly from uncertainties as to whether extensions can be granted. Most extensions seem to be given for further experiments and not for writing. The committee advises SILS to factor in writing time and discuss this upfront with the PhD candidate. PhD candidates express the feeling that right now they are required to do the writing in their own time, without being paid. In addition, the committee advises SILS to reconsider the financial incentive for finishing on time. This measure potentially increases inequality, for example, for primary caregivers, parents or people that have experienced health related problems. In addition, it creates pressure which will affect the quality of science in a negative manner.

Last, bursary PhD candidates form a special population within SILS. PhD candidates noted that foreign candidates would benefit from readily available information or assistance on practical things such as applying for social security and tax returns. Different bursary PhD candidates report different teaching duties, which conflict with their contracts. The committee advises to harmonize the rules and expectations. The bursary PhD candidates are a fragile population as they have a disadvantage in understanding culture and common standards. SILS should protect these candidates against situations of miscommunication. This PhD group will advertise SILS in an international manner and should not leave SILS with issues that are the result of such misunderstandings.

## 2.7 Final conclusions and recommendations

SILS is a very good life sciences institute and the UvA should be proud of the dedication of its personnel to provide high quality education in a variety of disciplines and at the same time performing very good research. The financial situation of SILS is complicated. While they are compensated for their educational efforts, this only partially covers the overall needs of the institute. As is common in biological and biomedical research, the activities of SILS require a considerable amount of lab space that has to be rented per square meter. This leads to disproportionate costs. Such a situation might be rather unique within the Science Faculty but is not uncommon in the landscape of science faculties, and



thus the committee pleads to the Science Faculty to carefully (re)consider a more customized allocation of financial support. In addition, it would be an excellent investment of the UvA Science Faculty to provide the director with financial or in-person support for attracting new and promising talent, thereby efficiently investing in the future of Biological and Biomedical research at a top level at UvA.

People working at SILS are highly dedicated, motivated, and generally happy. This is in part the result of the leadership of the director. SILS is a broad institute, which is important for their educational activities but also creates scientific opportunities that are only poorly explored. The committee provides suggestions how this may be improved.

- The committee confirms the weakness in the branding of SILS, as identified in the institute's SWOT analysis. This was most pertinent in the rounds of interviews in which no convincing answers were provided to the question, "what does SILS stand for?" It would be good to stimulate SILS management to define the overarching concept and vision of SILS more clearly, as this may be useful both for deciding about future directions of the research and education, and for further establishing the SILS brand.
- The committee was very pleased with the interactions with representatives of the different themes, and the resulting open discussions. It notes that this stems from a generally pleasant and accommodating atmosphere within SILS, which is dear and should be cherished. However, the committee feels that this could be even better when the different themes are more intensively interacting in search of scientific options in the other themes within SILS, and it provides some options on how to achieve this. A theme leader with clear responsibilities would provide opportunities to further improve inter-theme interactions.
- The committee advises SILS to better support and stimulate research activities by starting PIs, in part by optimizing teaching load and providing clear career trajectories.
- The committee was very pleased by the many outreach activities SILS is involved in but considered these too project- and PI-dependent and not integrated into the policies of SILS. The committee suggests SILS to define a clear policy or strategy related to societal relevance.
- SILS (with the help of the diversity and inclusion committee) should further develop a well-articulated and embedded strategy for diversity, involving the structured sharing of best practice and specific plans for increasing the diversity of staff and students.
- The committee feels that SILS can improve the support and information regarding social, emotional, and (mental) health-related well-being of PhD candidates.

The committee hopes that its observations and suggestions are useful for SILS to help to become an even more effervescent interdisciplinary research institute.



### 3. Assessment of the Research themes

#### 3.1 Research theme 1: Cell & Systems Biology

##### 3.1.1 Aim and strategy

The Cell & Systems Biology (CSB) theme expresses the aim to advance scientific knowledge through ground-breaking insights in eukaryotic molecular and cellular biology, via cutting-edge experiments, state-of-the-art technologies, and pioneering systems-biology approaches. As such, it is a broad nominator and has the potential to play a central part in the SILS programme as the concept of ‘Interactions between and within cells’ qualifies for collaboration with the other research themes. Especially the bioinformatics, microscopy and biosystems data analyses fulfil the criteria to connect with the other research themes. Whereas some research groups within the research theme indeed collaborate with many different groups across the SILS, not all do. Moreover, the different groups within the theme do not have many joint publications, which suggests limited collaboration while the opportunities (especially with the group for new fluorescent probes and microscopy activities) are significant. The CSB theme acknowledges this point and aims to strengthen collaborative research and further improve knowledge exchange within the CSB theme in the near future. Specifically, by the continuation and expansion of ongoing (small) collaborative projects and start of new synergistic collaborations, one aims to (i) strengthen the overall cross-connections, (ii) improve appreciation toward each other in the theme, (iii) use each other’s technological and biological know-how and opportunities to the full extent, and (iv) collect preliminary data for joint grant applications where applicable. The committee wholeheartedly supports this strategy and advises the theme to further exploit the opportunities for collaboration, both within the CSB theme and across SILS themes, in the future.

##### 3.1.2 Research quality

The research quality of the CSB theme is overall very good. Scientific output has been rather stable over the past evaluation period, whereas the field-weighted citation index has consistently been well above average and has steeply increased over the past few years. Whereas the committee acknowledges that the overall width of the five different research groups within the CSB theme puts forward certain challenges in terms of common grounds, she sees opportunities for the theme to develop unique research particularly in cross-group collaboration. The committee is pleased that the CSB researchers are aware of the increasing scale of modern science, as well as the shift to multidisciplinary approaches and that they express the wish to collaborate interdisciplinary. The participation in large consortia seems to be limited, but the CSB theme proposes to either join large research consortia, possibly acting as one partner made up by two or more CSB research groups with complementary expertise. Yet, own initiative in instigating such consortia could reflect a more proactive approach. According to the committee, the creation of top-notch interdisciplinary collaborations should yield interesting funding options and also – if correctly advertised (which is best through top publications) – attract foreign PhD/post-docs supported by EMBO or other grants.



### 3.1.3 Societal relevance

The main relevance of the theme is scientific, but there are clear activities that carry societal relevance as well. First and foremost, the CSB theme is very active in teaching in the bachelor's and master's programme Biomedical Science on different topics. One aims to provide bachelor and master students with well-balanced, up-to date curricula including both theory and development of practical research skills, plus ample opportunity to do high-quality internships. The theme sees further opportunities in the new faculty-wide Science, Technology and Innovation (ST&I) bachelor's programme, which provides the possibility to align interdisciplinary education and research with other FNWI institutes, thus enabling the expansion of multidisciplinary approaches and collaborations of interest for CSB. Yet, the current teaching load is also considered a threat, requiring efficient organisation and implementation of the diverse programmes and potentially an expansion of educational capacity. The CSB theme has also generated a successful spin-off. All CSB groups have numerous outreach and valorisation initiatives, ranging from public lectures to talking to popular press to patent applications. Moreover, to increase scientific impact and promote open science they have released several open-source software packages. As such, the CSB theme is very active in promoting the impact of their research and education efforts.

### 3.1.4 Viability

As emphasized before, the CSB theme has the potential to serve a central role within SILS in connecting the other research themes. To enhance collaboration within the theme, the CSB PIs have expressed their intention to initiate one or two central theme topics, in which each CSB section can participate. This would intensify interactions between CSB staff on all levels and stimulate the exchange of ideas, expertise and knowledge. The committee applauds these initiatives and was also pleased to hear during the interviews that over the past period the communication between CSB PIs has improved. Yet, there remain some unclarities, particularly regarding the specifics of the CSB theme plans, which still need to crystallize and be aligned with the SILS strategy in general. Also, the future position of the Biosystems Data Analysis (BDA) section is uncertain, with their new (to-be-appointed) chairholder deciding on the future position of that section. It is unclear to the committee who is in charge of guiding/defining the vision and strategy development of the CSB theme. Leadership is likely to reside with the SILS director, as is the talent management. It would be advisable to appoint a leader within the CSB theme with defined responsibilities.

### 3.1.5 Recommendations

This CSB theme has high quality research labs that are covering a broad range of activities. This offers many opportunities for highly original interdisciplinary research. The committee has some specific recommendations to achieve this aim.

- Appoint a theme leader with defined responsibilities such as fostering young talent and improving collaborations and innovation between the groups.
- Improve the harmonisation of research activities (where possible).





## 3.2 Research theme 2: Neurosciences

### 3.2.1 Aim and strategy

The organisation of the Neurosciences theme is well structured and contains a cluster of four more or less equally sized subthemes or research groups, each lead by a senior full professor. The thematic clusters are based on historically distinct research topics, which are nonetheless still relevant and relatively well separated, with possibilities for transversal collaborations (some ongoing). Such collaborations between the subthemes are needed, as the self-evaluation report indicates that historically the groups have been operating in isolation. In addition, it seems that the staff members in each group have their own research lines. The theme aims at promoting collaborations (within Neurosciences and with other SILS teams), for example by positioning newly hired assistant professors and postdocs between research groups. One of the new assistant professors is expected to be financed by the Dutch Government Sector plan subsidies, another one is foreseen through the replacement of a retiring staff member.

The committee suggests some additional measures to facilitate collaborations. Lateral interactions could be increased by sharing PhD candidates on aligned/complementary topics, by joint lab- and strategy meetings, and by a more extensive exchange of technologies and research tools. The Neuroscience theme harbours several lines of research that could strongly benefit from the technology platforms, and conversely, contribute to them. Technology-based collaborations also offer the possibility for sharing PhD candidates and postdocs and form a strong incentive to spearhead the application of novel techniques and to delve into new conceptual ideas. In addition, since the Neurosciences are strongly driven by technological innovation, all opportunities to cross-fertilize research lines with new tools will be beneficial for increasing research impact, as well as the attractiveness for new, talented, assistant professors, postdocs and PhD candidates – an important factor since postdocs applicants in neuroscience are often strongly driven by opportunities to increase their technical skillset.

The committee sees various opportunities that could be further explored. For example, the development of microscopy tools is very important for the field of Neuroscience. The groups can benefit from the very strong expertise that is present and even use it to advance beyond the state of the art. Conversely, newly developed *in vivo* imaging and optical stimulation methods are being developed within the Neurosciences, which are potentially transversally applicable in a larger SILS context and may inspire the Microscopy platform to develop new tools.

The Neuroscience theme seeks to play a role in SILS' expansion into Data Science and Artificial Intelligence, which is needed to accommodate the increasing need for analysis of large and complex data sets that are nowadays common in life sciences. Expertise in these fields is exquisite within the Science Faculty of UvA and although the new hire will mostly concentrate on Microbiome research, the topic can also be quite readily integrated in the Neurosciences themes – even at the conceptual level (e.g., neuron and brain circuit-inspired deep networks, learning algorithms). The committee agrees that this would align with the computational sciences that are already quite well developed within the Neurosciences Theme.

Within SILS, the Neurosciences theme harbours the largest number of FTEs (68.8 for total staff in 2022), and accordingly the largest research output and the heaviest load in terms of teaching hours. The self-evaluation report states that the Neuroscience staff spends on average 35-40% of their time on education with some staff members going over 50%. This has been identified as negatively impacting research activities (see point 3.2.4).



### 3.2.2 Research Quality

Neuroscience research at SILS is of high quality and is diverse. The 2022 FWCI score of 1.0 indicates that its impact is on par with the international average. However, the FWCI score has declined over the last two years and is below the SILS average of 1.6, which is a concern that needs to be addressed.

Nonetheless, the scientific relevance of all topics is high, and their research lines are well in tune with the current research focus globally and that of large international neuroscience institutions. It builds on strong technological developments which are state of the art. The assistant professors and associate professors within each group have distinct research projects that fit well under the larger umbrellas of each group. Some subthemes (i.e. groups) are a bit overlapping, but this is seen as an advantage as it forms a natural template for technical and conceptual collaborations. The listed publications indicate that group members collaborate and are co-authors on each other's papers. However, it is not obvious whether the criteria for co-authoring are similar in the four groups.

The academic reputation of the Neurosciences theme is high and seems on par with the other Neuroscience institutes in Amsterdam. However, the committee did not get a clear view of where the Neuroscience theme envisions its research activities amidst the landscape of the other Neuroscience institutes in Amsterdam (i.e., at the NIN and the AUMC) apart from its broad scope, strong embedding in the Science Faculty, and its exposure to a very large breadth of students. To improve the branding of SILS Neurosciences it would be useful to define the distinctions with the other Amsterdam Neuroscience institutes at the scientific and conceptual level, identify the opportunities these create, and highlight them in communications.

The researchers of the Neurosciences theme have been very successful in acquiring grants, but like the rest of SILS, they have also seen a decline in the number of successful applications for career grants. The self-evaluation report indicates that a high teaching load has a negative influence, especially for young starting group leaders. This is a threat for the development of new and impactful research topics (see point 3.2.4). Leadership within the team and providing protected research time for young group leaders may be an effective route to give them a stronger head start. The committee makes some suggestions to improve this aspect under the general recommendations for SILS.

### 3.2.3 Societal Relevance

The members of SILS Neurosciences are committed to outreach activities. They take part in public debates and are active in the scientific community (EBBS, FENS), as well as in patient organisations. Some of its members play key roles in local, national, and international collaborations or centres. The book 'The Code to Consciousness', aimed at a broader public, has received ample attention, and probably has positive societal impact. The commercial spin-off is also promising. Because of its strong educational activities, the Neurosciences theme also has large societal impact through the vast number of students that come through their programme – which disseminates Neuroscientific insights among the main public. Altogether, the committee concludes that, analogous to the rest of SILS, the societal engagement of Neuroscience is very high and laudable. Yet, in our discussions, the Neuroscience staff indicated that the outreach activities seem not truly valued by management and come on top of all other responsibilities of the staff. More palpable appreciation of these valuable efforts by SILS or faculty is advised.

The committee noted that the UvA has not yet signed the Dutch Transparency Agreement on the use of animals for research. This agreement aims to create a more open and transparent climate around animal-based research, by asking organisations to commit to clear communication to the media and public about when, how and why animals are used in research. The committee urges SILS, the Science



Faculty and UvA to take a strong stand in this discussion and keep supporting this type of research, which is absolutely essential for the sustainability of the Neuroscience theme.

### 3.2.4 Viability

The self-evaluation report pinpoints a high teaching load as a main threat for the development of strong research lines. The Psychobiology course in the bachelor's programme is one of the largest programmes at the faculty (in number of students), and SILS Neurosciences carries a lot of the teaching load. The Neuroscience master's programme is also extensive and branches out in all four groups. These educational activities bring in extra revenue. Further, compensational measures by SILS and the Science Faculty have been taken to alleviate teaching duties per staff member (resulted in space for the hiring of 3 assistant professors and 8 PhD candidates). The self-evaluation report indicates that this has partially relieved the overall load. The committee suggests that the high load from which some staff members still seem to suffer may be remedied by additional measures (e.g. reduction of contact-hours) and by some of the recommendations that have been made in section 2.5. Specific to Neuroscience, the theme may benefit from guest lectures and open online courses that have been developed elsewhere. The production of a SILS Neurosciences open online course could be considered. This would also increase visibility and help branding. Together, these measures could spur the development of new research lines and aid new grant applications.

The strong sense of community within Neurosciences theme strongly aids to its viability. As for two other themes at SILS, the organisation of the Neuroscience theme holds the middle between a 'flat' organisation – in which each assistant professor, associate professor, or full professor is completely independent, and a vertical organisation – in which staff members all report to the leading professor and conduct research along pre-set lines. Ambiguity in this structure may lead to misconception about career trajectories (also from an outsider's perspective) and diminish the sense of independence, which may impede starting assistant professors as well as associate professors and hinder successful applications to career grants.

### 3.2.5 Recommendations

The Neurosciences theme is well structured and functions smoothly, and harbours strong possibilities for transversal collaborations within and outside the theme. The committee endorses most of the findings in the theme's self-evaluation report and provides the following recommendations to address them:

- Intensify and stimulate transversal collaborations within and outside of the theme based on mutual interests and niche opportunities, using technology transfer between the subthemes and with groups outside of Neurosciences as a driving force.
- Promote and stimulate research lines by starting staff members and improve their competitiveness in acquiring career grants by optimizing teaching duties and teaching loads within the theme.
- Provide clarity and uniformity in the structure of the research subthemes (hierarchy, co-authorship, independence of staff), and improve clarity about benefits of and duties within collaborative efforts – and align all of this with the other themes of SILS.



### 3.3 Research theme 3: Microbiology

#### 3.3.1 Aim and strategy

The Microbiology theme has clear strategic goals detailed in the self-assessment report, but these are defined largely in terms of personnel, infrastructure and funding. These are all to be commended. The committee felt that there was a lack of a clear scientific strategy. It was not clear how the group plans to be at the forefront of developments across quite a disparate set of scientific areas. The microbiome was often identified as a key area going forward, but which area of microbiome science was not explicitly defined.

The upcoming appointment of a new senior professor in Microbiome Engineering is very welcome. The appointment of suitably qualified technical staff is also a very welcome development. There was a sense that the theme has not fully moved on from the chair group structure and may be out of sync with some of the other SILS themes in this regard. Some of the younger professors regard themselves as members of the chair group, while others feel more independent and more responsible for their own career development.

There was a strong emphasis on quality PhD supervision, which was recognised by the committee. It was noted that the theme does not have a dedicated graduate school, unlike some of the other themes.

#### 3.3.2 Research quality

The overall impression of the committee was of a group of active scientists, working on important problems within microbiology. These individuals are working across a broad remit, covering a wide range of topics. This is not a criticism, more of an observation. There was a lack of coherence in terms of stated common goals, and this was illustrated by only a small number of inter- and intra-theme collaborations. This is a missed opportunity, since many of the groups could probably collaborate successfully and find novel and productive research projects at the interface of current research interests. The teaching load was mentioned as a concern in terms of research quality by many of the younger staff. While the publication level has been impressive and in some very good journals, it is a concern that the FWCI scores for Microbiology have been falling over recent years and are now below 1.0.

Two endowed chairs contribute to the theme but are retiring in the next two years. There may be an opportunity to bring in new endowed chairs that could facilitate the planned move to microbiome research.

The Microbiology theme holds theme-wide meetings, and also has monthly meetings with other microbiology groups in Amsterdam. This was viewed very positively by the committee.

#### 3.3.3 Societal relevance

The topics investigated in the Microbiology theme are extremely relevant to society. They are addressing major societal issues that are clearly synchronised with several of the UN's Strategic Development Goals (SDG's). The theme is significantly engaged in education and public outreach and should be commended for that. Several lectures to scientific and public audiences are outlined, and the staff are also highly active in committee-work and on editorial boards. The committee was impressed by the success rate in larger consortium projects which is a credit to the staff. Valorisation through the launch of a spin-out company is also a very good metric.



### 3.3.4 Viability

The Microbiology theme is the smallest of the four themes within SILS, but its focus on the microbiome could place it at the centre of the SILS vision and confirm it as a central player within the institute. The theme also includes the mass spectrometry core facility, which provides an additional link to other themes in SILS. These are opportunities that will require a strategic vision and planning, with clear milestones and measurable outcomes.

The Microbiology theme (usually referred to as a cluster by staff within the theme), is facing challenging times, but is well placed to meet these challenges. They are undergoing a shift in focus towards a microbiome-based approach, although not all the group leaders intend to change their focus from their current research areas. Several of the junior professors have vibrant and interesting programmes in the microbiome area. The theme also has the opportunity to hire a new professor in Microbiome Engineering who can act as a driver of this new direction. The committee felt that it would be in the interest of the theme to define a clear strategy of what area or aspect of microbiome science to focus on, and it is a clear opportunity to seek convergence and collaboration with several, if not all, of the other themes within SILS. The junior staff, as the future of the SILS, should be significantly involved in the choice of area and expertise of the new professor. The committee would challenge the theme to define clear strategic scientific objectives that could be achieved using the joint resources of the PI's and their teams. There should also be a strategy to increase the impact and recognition of the work emanating from this theme, possibly by harnessing the unique opportunities for collaborative research across the themes within SILS.

The committee noted that the PIs within the Microbiology theme work in a very competitive set of areas, but do not seem to focus their efforts on a specific set of related problems. This could prove problematic and may not be sustainable in the long run in such a competitive environment as microbiome science.

### 3.3.5 Recommendations

In sum, the committee wants to make the following recommendations:

- Define a clear vision with strategic scientific objectives.
- Define a clear strategy of what area or aspect of microbiome sciences to focus on.
- Consider developing a, or merging with an existing, graduate school for its PhD candidates.



### 3.4 Research theme 4: Green Life Sciences

#### 3.4.1 Aim and strategy

The Green Life Sciences (GLS) theme is organized around clear strategic goals with respect to scientific vision, teaching, and management. The research focuses primarily on mechanisms underlying plant development and the interaction of plants with their environment. This matches current trends and needs (see also the Sectorplan) and offers opportunities for collaborations with other SILS themes through, for instance, microbiome research, imaging, and large data science. Nevertheless, the overall purpose of the GLS programme could be more clearly defined than the catch-all ‘providing new knowledge in the field of molecular plant sciences’.

The GLS theme has been strategic in their distribution of teaching responsibilities, and the committee noted that the theme more effectively balances extensive teaching with research. The decision to minimize teaching responsibilities for starting PIs is commendable and mirrors the general advice from the committee. The GLS master track was viewed as being very successful. The theme seeks to expand the track’s capacity, future PI and staff numbers permitting, which will benefit the plant sciences nationwide.

There is evidence of strong leadership within the theme, which has fostered a flattened hierarchy and a shared sense of purpose. Indeed, the committee noted a particularly strong cohesiveness among the GLS groups that is augmenting both research and teaching quality. Joined leadership and cohesion will be important for the theme’s continued success also when five senior PIs retire over the coming five years.

The theme is aware of the need for a concrete recruitment plan, but this currently remains somewhat underdeveloped. Ideas to set up a mentoring programme and to organize strategic brainstorming events would be valuable new implementations. Moreover, the committee felt that specific strategies should be implemented to recruit highly qualified women onto upcoming vacancies. It is important that junior faculty will be involved in staff recruitment and in the strategic planning of the GLS theme.

The more immediate appointment of a new assistant professor as well as a senior professor in Plant Cell Biology is important, given that cell biological approaches are commonly used in every team.

#### 3.4.2 Research quality

The research of the GLS groups is generally of high quality. The theme regularly publishes highly cited work in top-ranked journals, and although the overall publication number in 2022 was lower, the FWCI, that is already comparatively high, increased significantly.

PIs have international recognition, as evidenced by international collaborations and a large number of lectures at major scientific conferences. The committee specifically noted that assistant professors and associate professors within the GLS groups have a strong independent visibility. The theme has also been particularly successful in acquiring third-party funding, including individual grants, large consortium grants, and awards from industrial partners. In addition, junior PIs have shown notable success in acquiring highly prestigious personal career awards, including two recently awarded VIDI grants (2023).



### *3.4.3 Societal relevance*

There is no doubt that the GLS theme addresses scientific questions with significant societal relevance. GLS members also have strong links with industry and are frequently involved in public outreach activities. The number of public lectures, lay articles, opinion pieces, and teaching activities outside of the UvA is impressive.

### *3.4.4 Viability*

The GLS theme has been very effective with regard to scientific output, brings in a disproportionately high percentage of third-party funding, is responsible for many successful PhDs, and generally contributes significantly to SILS' visibility. It has created a culture of trust and mutual support that fosters success at every level. However, a considerable number (five out of fourteen) PIs within the GLS theme will retire in the coming five years. Plans are in place to strengthen the Plant Cell Biology group. It will be important to maintain a strong presence also in the other GLS areas, not only with respect to staff quality but also staff numbers. This is relevant to preserve the theme's competitiveness. GLS is currently regarded to be an attractive partner in large national consortia and in collaborations with industry. To maintain and extend such relationships, critical mass on a diverse set of relevant topics is essential. Similarly, it should be avoided that the upcoming retirements lead to an increased teaching burden for junior staff, or a weakening of the teaching portfolio that reduces student visibility.

The committee noted that collaborations primarily occur within each of the five GLS groups. The theme could significantly benefit by increasing synergy between the groups. The envisioned brainstorming and planning meetings, maybe in the form of retreats, could foster this.

### *3.4.5 Recommendations*

The committee endorses the findings in the theme's self-evaluation and provides the following additional recommendations:

- The upcoming retirements bring opportunities for broader integration within SILS, but also require a strategic vision and concrete recruitment plan to ensure the theme's continued success. The junior staff should be significantly involved in these.
- The mentoring of new PIs is strongly encouraged to ensure continued success with grants and to maintain the close ties to industry.



## Appendix A - Programme of the site visit

<b>June 14</b>	
14.00 – 15.00	Preparatory meeting chair SEP committee, institute director and institute manager
15.00 – 17.00	Preparatory meeting committee
17:00 – 19:00	Welcome to Committee by management (dean + management team)
19:00	Dinner committee
<b>June 15</b>	
09:00- 10:00	Interview with management team SILS
10:00 – 10:30	Review committee + preparation next interview
10:30 – 11:30	Interview session Cell & Systems Biology
11:30 – 12:00	Review committee + preparation next interview
12:00 – 13:00	Interview session Neurosciences
13.00 - 14.00	Lunch
14:00 – 14:30	Review committee + preparation next interview
14:30 – 15.30	Interview session Microbiology
15:30 – 16:00	Review committee + preparation next interview
16:00 – 17:00	Interview session Green Life Sciences
17:00 – 18.30	Review committee + preparation day 3
19:00	Dinner committee
<b>June 16</b>	
09:00 – 09:45	Interview PhD candidates
09:45 – 10.00	Review committee + preparation next interview
10:00 – 10:45	Interview early career staff
10:45 – 11.00	Review committee + preparation next interview
11.00 – 11.45	Interview with respect to valorisation
11.45 – 12.00	Review committee + preparation next interview
12.00 – 12:45	Interview representatives diversity, inclusion policy
12:45 – 13:45	Lunch
13.45 – 14.30	Interview representatives technicians, technical facilities
14.30 – 15.00	Review + preparation next interview
15.00 – 15.30	Interview remaining questions with management
15.30 – 17:00	Internal meeting committee – review, writing, preparation preliminary findings
17:00 – 17.30	Presentation preliminary findings
17:30	Drinks





## Appendix B - Quantitative data

### B.1 SILS - Research staff in FTE

	2017	2018	2019	2020	2021	2022
<i>Scientific staff</i>						
Assistant professor	29.8	27.5	29.8	29.5	32.6	32.7
Associate professor	10.8	11.0	11.0	13.0	13.0	13.0
Full professor	12.6	13.6	12.7	12.7	12.5	12.0
Postdocs	34.4	31.8	28.5	22.5	19.3	22.4
PhD candidates	63.9	64.8	68.8	75.2	80.6	73.0
<b>Total fte research staff</b>	<b>151.5</b>	<b>148.7</b>	<b>150.8</b>	<b>152.9</b>	<b>158.1</b>	<b>153.1</b>
Support staff	8.5	9.7	16.2	15.6	16.3	16.1
Technicians	42.6	41.5	47.9	49.7	46.8	40.3
<b>Total staff</b>	<b>202.6</b>	<b>199.9</b>	<b>214.9</b>	<b>218.2</b>	<b>221.2</b>	<b>209.5</b>

### B.2 SILS - Funding (in fte) and expenditure (in M€)

	2017	2018	2019	2020	2021	2022
<i>Funding</i>						
Direct funding	115.7	113.5	132.3	128.0	138.3	137.8
Research grants	34.6	30.4	29.9	34.4	32.2	23.3
Contract research	52.3	56.1	52.8	55.7	50.9	48.4
<b>Total funding</b>	<b>202.6</b>	<b>200.0</b>	<b>215.0</b>	<b>218.1</b>	<b>221.4</b>	<b>209.5</b>
<i>Expenditure</i>						
Personnel	11.79	12.26	12.72	14.61	15.73	13.53
Other costs	10.61	10.02	11.31	10.72	10.55	10.98
<b>Total expenditure</b>	<b>22.40</b>	<b>22.73</b>	<b>24.04</b>	<b>25.33</b>	<b>26.28</b>	<b>24.51</b>

### B.3 SILS – PhD enrollment and success PhD candidates

	M	F	≤ 4 yr	≤ 5 yr	≤ 6 yr	≤ 7 yr	7+ yrs	Not yet finished	Discontinued
2014	12	11		5	4	4	4	1	5
2015	12	20	8	8	5	1		4	6
2016	8	15	3	7	6			3	4
2017	17	18	3	8	2			18	4
2018	11	10		1				17	3

