



Seventh Annual Report

July 2017 - June 2018

PlantLink is a network for plant science in Southern Sweden. It was formed in 2011 as an alliance between Lund University (LU) and the Swedish University of Agricultural Sciences in Alnarp (SLU Alnarp) with initial support from the Skåne Regional Council (Region Skåne). Our ambition is to stimulate, unite and promote plant research and higher education in the region.

PlantLink wants to bridge the gap between basic and applied plant research with the objective to provide plants as part of a sustainable agriculture for healthy food, medication, energy and new green materials. Associated to PlantLink are several within their field world-leading research groups.

PlantLink strives to increase the interest and competence in plant science through education and information. Our goal is to create an environment that excels plant research and innovation and that leads to dynamic interactions between the universities, private companies and the general public.

Research

PlantLink Focus Areas

- Plant Breeding and engineering
- 'Post-harvest' – quality and new products
- Abiotic stress
- Biotic interactions
- Modelling and informatics NEW!
- Plants, People and Society NEW!

Major research projects associated with researchers in PlantLink

- Future oil crops (SSF)
- Production of a blood substitute (SSF)
- TC4F Theme 4
- STEPS (Mistra)
- Mistra Biotech (Mistra)
- ScanOats (SSF)
- NordPlant (NordForsk)
- EMPHASIS-PREP (ESFRI)

Focus on bioinformatics

The PlantLink bioinformatician has been in place since June 2012 with the aim to strengthen the bioinformatics competence in plant research in Southern Sweden. The bioinformatician is part of the NBIS Swedish network of bioinformaticians and SLUBI, SLU's new bioinformatics network. Over 20 larger bioinformatics projects have been supported, leading to more than 20 publications.

In 2017 Alexander Koc was temporarily the PlantLink bioinformatician. From the 1st of October 2017 Varma Saripella was recruited co-supported by SLUBI and the LTV faculty in Alnarp. This new position is part of the Plant Breeding Department at SLU and a larger SLU-driven effort to strengthen bioinformatics. PlantLink supports 25% of the position and ensures a continued close collaboration with LU researchers and maintenance of the PlantLink server.

In January 2018 a new computer server, Udda - named after Udda Lundquist for her life-long contribution to plant science - was taken into operation. With its 576 CPUs, 640 GB RAM and 11 TB HDD + 400 GB SSD disk space it enhances the server capacity greatly!

We welcome bioinformatician Varma!

We welcome our new PlantLink-associated bioinformatician Ganapathi Varma Saripella, or Varma for short. Varma started at SLU Alnarp in October 2017 as part of the new SLU initiative SLUBI (www.slubi.se).

Most recently he comes from INSERM-UPMC at Sorbonne university in Paris, France. Varma works 25% for PlantLink and focus on keeping the contact between bioinformaticians at LU and SLU Alnarp. He is also part of the national network of bioinformaticians NBIS. He will maintain the PlantLink server as well as the new more powerful server Udda. If you need bioinformatics support please contact Varma by using our new online

form at www.plantlink.se



New bioinformatician Ganapathi Varma Saripella

PlantLink supported publications 2017-2018

Ahmadi-Afzadi, M., Orsel, M., Pelletier, S., Bruneau, M., Proux-Wéra, E., Nybom, H., & Renou, J. P. (2018). Genome-wide expression analysis suggests a role for jasmonates in the resistance to blue mold in apple. *Plant Growth Regulation*, 85(3), 375-387.

Burra, D. D., Lenman, M., Levander, F., Resjö, S., & Andreasson, E. (2018). Comparative Membrane-Associated Proteomics of Three Different Immune Reactions in Potato. *International Journal of Molecular Sciences*, 19(2), 538.

Gustafsson, C., Willforss, J., Lopes-Pinto, F., Ortiz, R., & Geleta, M. (2018). Identification of genes regulating traits targeted for domestication of field cress (*Lepidium campestre*) as a biennial and perennial oilseed crop. *BMC Genetics*, 19(1), 36.

Ivarson, E., Iven, T., Sturtevant, D., Ahlman, A., Cai, Y., Chapman, K., ... & Zhu, L. H. (2017). Production of wax esters in the wild oil species *Lepidium campestre*. *Industrial Crops and Products*, 108, 535-542.*

Ivarson, E., Leiva-Eriksson, N., Ahlman, A., Kanagarajan, S., Bülow, L., & Zhu, L. H. (2017). Effects of overexpression of WRI1 and hemoglobin genes on the seed oil content of *Lepidium campestre*. *Frontiers in Plant Science*, 7, 2032.*

Walter, A. J., Willforss, J., Lenman, M., Alexandersson, E., & Andreasson, E. (2018). RNA seq analysis of potato cyst nematode interactions with resistant and susceptible potato roots. *European Journal of Plant Pathology*, 1-9.

Zhang, K., Zhou, T., Ye, L., & Bülow, L. (2017). Characterization of Protein-Protein Interactions in Recombinant Hemoglobin Producing *Escherichia coli* Cells Using Molecularly Imprinted Polymers. In *Oxygen Transport to Tissue XXXIX* (pp. 367-373). Springer, Cham.*

*Seed money project, others are with bioinformatics support

Plant, People and Society - a new focus area

PlantLink is continuously working on renewing itself and overlook its focus areas. In 2017, the steering committee decided to broaden the scientific scope. This led to an overhaul of the existing focus groups, where the need to include plant research related to society was identified. A group of researchers from bioeconomy, urban systems, physical geography and plant-human interactions was formed. Based on the discussions in this group PlantLink's steering committee took a decision to establish the new focus area called Plants, People and Society beginning of 2018.

Introductory meetings with interested researchers have been organized during the last year to define the aims of the focus area. The outcome of the meetings was that there is an interest in research on plant products and innovations and how these will be received by society. In addition, there was an interest in urban farming. As a consequence, Plants, People and Society will focus on the two topics: Agricultural innovations, policies for these and evaluations in terms of Ecosystem services and on urban ecology, urban farming and gardens.

PlantLink will continue to support this group. On the PlantLink day 12 September 2018, one session will be devoted to Plants, People and Society. More information of the current focus areas can be found on PlantLink's homepage.

Large grant to PlantLink-led consortium

In December 2017, a PlantLink-led consortium was granted no less than 16 MSEK from NordForsk to establish a Nordic University Hub, which will be running for up to six years. The competition was stiff with only 6 out of 63 applications granted support. The project "NordPlant - A Climate and Plant Phenomics Hub for Sustainable Agriculture and Forest Production in Future Nordic Climates" will create a research network focusing on plant phenotyping and growth facilities.

In the NordPlant consortium, five Nordic universities with versatile and complementing research infrastructures are joining forces to promote

education, research mobility and technological development to meet future challenges in agriculture and forestry. Recently established facilities for both plant phenomics and climate modelling are key parts of this project. NordPlant will establish five focus groups in the area. Apart from LU and SLU, NordPlant consists of UiT in Tromsø, University of Helsinki and University of Copenhagen. The kick-off of NordPlant will take place on 24-25 October, 2018, in Helsinki. For more information on NordPlant see www.nordplant.org



The new NordPlant logo

Education

PhD Education

During the last year PlantLink has supported one PhD course and one introductory course in UNIX: „Plant Imaging Techniques“, 14-18 May, 2018, in Lund and „Introduction to UNIX“, together with NBIS and GENECO, 20-22 November in Lund. Together these courses attracted more than 30 participants.

The cooperation with Post Graduate Courses in Life Science (PCLS) at Lund University continued for a fifth time during the autumn 2017, giving PhD students at SLU Alnarp full access to about 15 PhD-courses in molecular biology at Lund University. This collaboration continues in 2018 with the support of the LTV faculty at SLU Alnarp.

Master studies

A master students' summer school within ELLS (Euroleague for Life Sciences), with the name „Analysis and utilization of genomic diversity for plant breeding“, was organized 6-12 August, 2017, in Hohenheim, Germany. 29 students attended this summer course. Members from the ELLS subject area „Plant Molecular Breeding and Biotechnology“ met in November 2017 in Copenhagen. The subject area was formed after an initiative from PlantLink and includes five of the six ELLS universities with Lund University as an associated university. In the beginning of 2018 PlantLink initiated a new ELLS subject area called Plant Health.

Meeting: Promoting Plant Research



On 15-16 March 2018, more than 60 plant scientists gathered in Lund for a lunch-to-lunch meeting on the future of plant research in Sweden. The meeting was organized by PlantLink in collaboration with

Umeå Plant Science Center and the Linnaean Center for Plant Biology. The presentations were centered around the three themes New Swedish plant research initiatives, Swedish plant research in an international perspective, and Outreach and how to build a strong network. The plants highlighted spanned from oats to forest trees, and examples were given from both molecular and field scales. Among other things, presenters lifted

the oats genome, plant research at the new electron accelerator MAX IV, plant-based bioeconomy and nutritional uptake in forest trees. The meeting ended with a discussion led by Stefan Jansson representing Umeå Plant Research Center and SPPS about the possibility of organizing future Swedish Plant Biology days. These discussions will continue. A summary of the meeting can be found on PlantLink's homepage.

Budget and organization

PlantLink had a budget of ca 1.5 million SEK over the year, with SLU and LU contributing ca 1 million and 0.5 million SEK each. From July 2017 to June 2018 the total salary costs were 875,000 SEK. Positions funded were one director (30-50%), one assistant director (25%), one NordPlant administrator (20%) and one bioinformatician (25%). Other costs include information and outreach events, seminars, website and travels. From spring 2018 NordForsk will contribute with 250,000 SEK/year for coordination of the project NordPlant.

PlantLink Personnel 2017-18

Erik Alexandersson (director)
Tina D'Hertefeldt (assistant director)
Varma Saripella (bioinformatician from 1 October 2017)
Alexander Koc (NordPlant administrator from 1 March 2018)
Thomas Welwert (administrator)

Steering committee, 2017-2018

Marianne Sommarin, Umeå University, chair
Erik Andreasson, SLU
Leif Bülow, LTH
Rajni Hatti-Kaul, LU
Annette Olesen, Lantmännen Lantbruk
Allan Rasmusson, LU
Jens Sundström until June 2018, SLU
Mariette Andersson, SLU
Magnus Carlsson, PhD representative, SLU
Groa Valgerdur Ingimundardottir, PhD representative, LU
Vacant, Region Skåne
Permanent observatory members:

Svend Christensen, University of Copenhagen
Paul Jensen until November 2017, SLU

Steering committee meetings

4 October 2017, Alnarp
11 December 2017, Lund
26 March 2018, Lund
1 June 2018, Alnarp



ELLS course „Analysis and utilization of genomic diversity for plant breeding“ 6-12 August, 2017, in Hohenheim, Germany



Outreach

Social media

PlantLink has continued its extensive work with social media for the spreading of plant science news, information, upcoming events etc. On Twitter we have more than 1000 followers representing important organizations in plant science such as journals, institutes and companies. Over 1700 people like our Facebook page. Nine newsletters are distributed per year and our homepage (www.plantlink.se), which carries information on PlantLink's work and structure, associated researchers, relevant courses etc., was visited on average by over 100 unique visitors per week. During the year we also launched NordPlant's new homepage, www.nordplant.org

Interactions

PlantLink has continued to interact with several partners both in- and outside of our region, such as Region Skåne, Copenhagen Plant Science Center, The Linnean Centre for Plant Biology, Umeå Plant Science Center, EPSO, Mistra Biotech and Partnership Alnarp. In collaboration with Vetenskap i Skolan (ViS) two high school students did a summer internship related to plant research. Guided visits for high school students as well as other groups from the Skåne region are done upon request.

Stronger collaboration with Copenhagen

PlantLink and Copenhagen Plant Science Center (CPSC), part of the Department of Plant and Environmental Sciences (PLEN), at University of Copenhagen have over several years had joint events, such as workshops, and engaged in an active discussion around plant research in the region. To formalize this work a Letter of Collaboration was signed in October 2017 between PlantLink and PLEN.

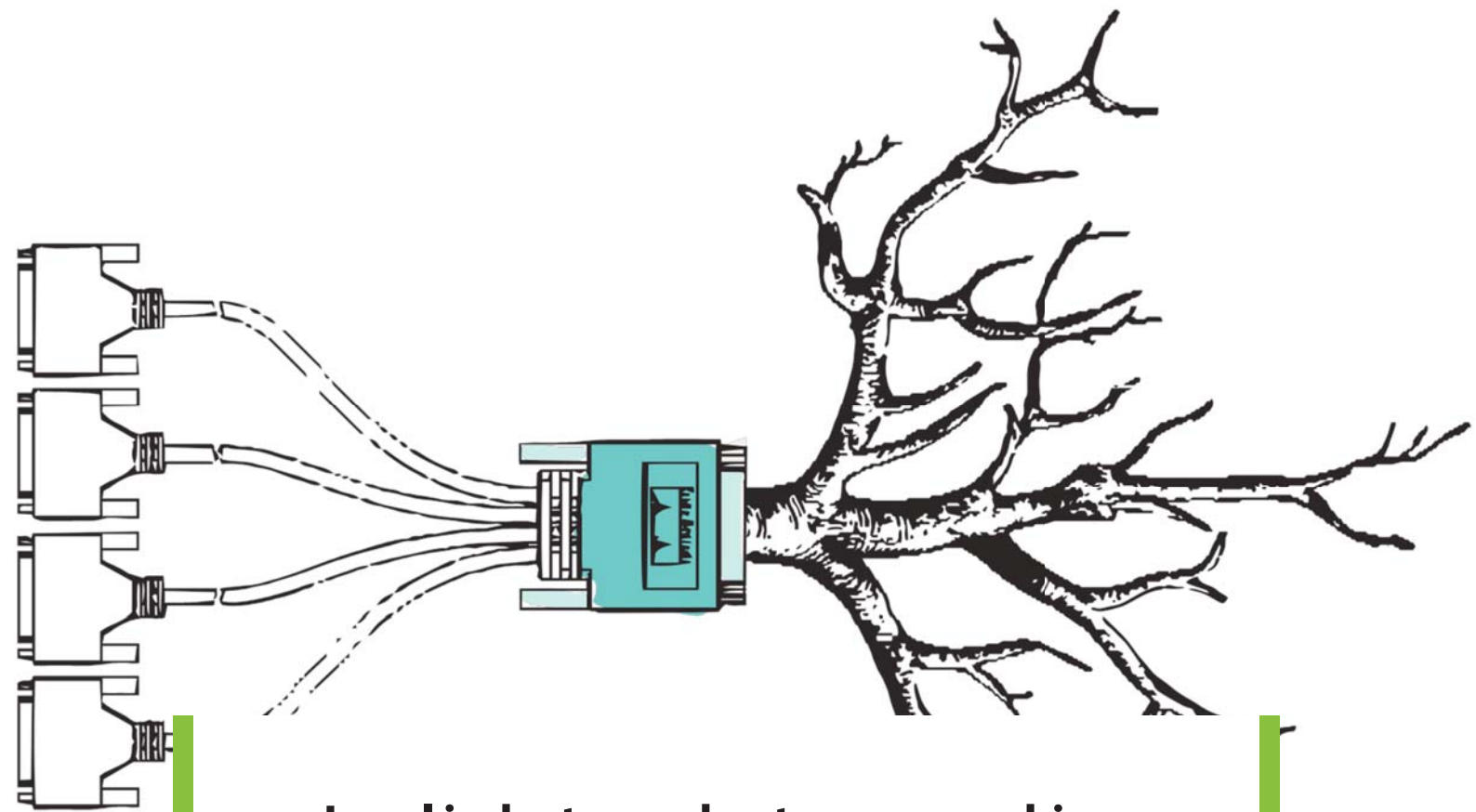
This initiative strives to further develop joint activities with the intent of strengthening scientific linkages between the academic institutions and support plant research in academia, private enterprises and the general public in the Greater Copenhagen region.

A task force working on joint projects has been formed during the spring of 2018. This will improve the flow of information and help identify areas of

common interest. SLU Alnarp has now, for example, joined the Plant Biologicals Network (PBN) hosted by University of Copenhagen.



Letter of Collaboration signed by PlantLink and PLEN at University of Copenhagen



Local industry and entrepreneurship

Several of PlantLink's research activities are in close collaboration with local businesses in plant research. One important outcome is the PlantLink PhD/Post Doc Industrial Mentorship Program, which was run for the third time during 2017-18. From 2018 PlantLink is supporting SLU Alnarp as a member of the Plant Biologicals Network (PBN), a Southern Scandinavian network facilitating knowledge exchange on research, innovation, regulation, and education for plant biologicals (www.plantbiologicals.dk).

PlantLink events 2017 - 2018

(number of attendees in brackets)

- 3rd round of PlantLink Industrial Mentorship, first meeting 30 June visiting Malmö University Open Lab and Medeon in Malmö and ending with NordGen visit 9 February 2018 (14)
- Presentations of PlantLink during SEB Gothenburg conference and SPPS conference in July and August, 2017
- ELLS MSc summer course „Analysis and utilization of genomic diversity for plant breeding“ , 6-12 August, 2017, in Hohenheim, Germany (29)
- New PlantLink homepage, August
- PlantLink Day, 4 October in Alnarp (77)
- Introductory course in UNIX, together with NBIS and GENECO, 20-22 November in Lund (20, max number)
- Meeting: “Promoting Plant Research in Sweden“, 15-16 March 2018, Lund (79)
- PhD course in Plant Imaging Techniques, 14-18 May, 2018 (9)
- NOVA PhD course “Phenotyping Technologies in Plant-environment Interactions – Integrated Analysis of Omics Data“, 11-15 June in Alnarp (21)

Upcoming events 2018

- **ELLS Master's student summer course „Genomics for Plant Breeding and Biotechnology“** , 19-25 August in Warsaw, Poland
- **MSc/PhD course „Plant Protection Biology“** , 20-31 August in Alnarp
- **Official kickoff of Plant Biologicals Network (PBN)**, 5 September in Copenhagen
- **PlantLink Day**, 12 September in Lund
- **NordPlant kick-off**, 24-25 October in Helsinki

Contact and more information

Follow us on Facebook and Twitter to get continuous updates from PlantLink.
For more information check our homepage: www.plantlink.se

Name	E-mail	Telephone
Erik Alexandersson Director	erik.alexandersson@slu.se	+46 (0)40-41 53 38
Tina D'Hertefeldt Assistant Director	tina.dhertefeldt@biol.lu.se	+46 (0)46 222 37 75
Ganapathi Varma Saripella Bioinformatician	ganapathi.varma.saripella@slu.se	
Thomas Welwert Administrator	thomas.welwert@slu.se	+46 (0)40-41 50 02