PLANT SCIENCE INSTITUTE

Internal Ref # **1**	Title of Research Project: **Epigenetic breeding of vegetables**

Project Leader: Tzahi Arazi	Email : **tarazi@agri.gov.il** Phone :

Institute: ARO Volcani Center
Department: Institute of Plant Sciences

The research team (other scientists):

Short Description of Research Project (3-5 lines):
Exposing novel variation in crops can play a major role in elevating future yields. An increasing body of evidence indicates that epigenetic variation provides an unexploited resource for plant breeders. Still, past epigenetic studies of crops were limited and designed only as a proof of concept. Goal of study: To generate stable epigenetic crop populations and identify in them epigenetic variants with superior yield and stress resistance. Importance of study: The proposed research is significant since it intends for the first time to perform a large-scale systematic investigation of epigenetic variation in vegetable crops. The outcome of the proposed research program: Induction of hypomethylation in corresponding crops is expected to expose various transient and stable crop epi-phenotypes. These phenotypes will provide state of the art knowledge on the role of methylation in tomato, pepper and melon and serve as a unique resource to identify agriculturally useful epiallels that will be utilized in breeding programs for crop improvement.

Required Qualifications of Visiting Scientist:
Education:
Ph.D.

Scientific Experience:
Ph.D. in plant molecular biology

Abilities and Skills:
Knowledge in molecular biology techniques.

Internal Ref # **2**	Title of Research Project: Physical and genetic Mapping of Powdery Mildew resistance genes using *T. durum-T.dicoccoides* substitution lines

Project Leader: Dr. Roi Ben-David	Email: **roib@volcani.agri.gov.il** Phone :

Institute: **Institute of Plant Sciences**

Department: **Department of Vegetables and Field crops**

The research team (other scientists):

Short Description of Research Project (3-5 lines):
The project will include Phenotypic screening of *T. durum-T.dicoccoides* substitution lines in order to physically map Powdery mildew resistance genes. BRIL (back crossed recombinant inbreed lines) will be created by crossing tetraploid wheat material (susceptible Durum cv. X resistance substitution line). These BRILS will be used for Genetic mapping with molecular markers. The newly identified genes will be transferred into elite Israeli durum cultivars.

Required Qualifications of Visiting Scientist:
Education:
PhD, plant biology

Scientific Experience:
Working experience as Research Scientist (preferred).

Abilities and Skills: Molecular and field work expertise, experience in biometric analysis (ANOVA etc.), experience in genetic mapping and molecular markers.

Internal Ref # **3**	Title of Research Project: **RNA silencing suppression by geminiviruses and molecular approaches to combat them**

Project Leader: **Yedidya Gafni**	Email : **ygafni@volcani.agri.gov.il** Phone : +972-3-9683471

Institute: **Plant Sciences**

Department: **Genetics and Vegetable Research**

The research team (other scientists): **Moshe Lapidot** (collaborator)

Short Description of Research Project (3-5 lines):

Tomato yellow leaf curl geminivirus (TYLCV) is a major tomato pathogen, causing crop losses worldwide. We have identified a TYLCV protein, V2, which acts as a suppressor of RNA silencing, and showed that V2 interacts with the tomato member of the SGS3 protein family known to be involved in RNA silencing. We use this data to study the possible involvement of the host innate immune system, i.e., RNA silencing, in plant defense against TYLCV and the molecular pathway(s) by which TYLCV may counter this defense.

Required Qualifications of Visiting Scientist:

Education: Ph.D. in plant molecular virology or a closely related field

Scientific Experience: Work in the field of plant virology or plant molecular biology. Publications in the field will be an advantage.

Abilities and Skills: Experience in greenhouse work with plants as well as knowhow in all aspects of molecular biology are prerequisite.

Internal Ref # **4**	Title of Research Project: Studies on the biological role of strigolactones, the new plant hormones, in plant development: genetic and physiological analysis of new mutants.

Project Leader: Dr. Hinanit Koltai	Email : hkoltai@agri.gov.il Phone : 972-3-9683039

Institute: ARO, Volcani Center

Department: Plant Sciences

The research team (other scientists):

Short Description of Research Project (3-5 lines):

The research will be focused on studies on the biological role of strigolactones, the new plant hormones, in plant development. The research is expected to identify new components of strigolactones signal transduction, and lead to a better understanding of strigolactones regulation on plant development in two plant models: tomato or Arabidopsis.

Required Qualifications of Visiting Scientist:

Education: PhD

Scientific Experience: Plant molecular biology and physiology

Abilities and Skills: Precision, background in statistics, will and ability for a dedicated work

Internal Ref # **5**	Title of Research Project: **Virus-host interactions: Elucidation of the *Tomato yellow leaf curl virus*-tomato host interactions.**

Project Leader: **Dr. Moshe Lapidot**	Email : **lapidotm@volcani.agri.gov.il** Phone : **+972-3-50-6220568**

Institute: **Plant sciences**

Department: **Vegetable Research**

The research team (other scientists): **Dr. Ilan Levin, Dr. Moshe Reuveni**

Short Description of Research Project (3-5 lines):

Tomato yellow leaf curl virus **(TYLCV) is one of the most devastating viruses of cultivated tomatoes worldwide. Our objective is to characterize the interactions between the tomato-encoded genes and their protein products with the virus genes and protein products.**

Required Qualifications of Visiting Scientist:

Education: **Plant molecular biology, virology.**

Scientific Experience: **Experienced in plant molecular biology techniques.**

Abilities and Skills: **PCR and quantitative PCR, protein analyses on a whole plant basis, yeast two-hybrid system. Good communication skills in English are essential**

Internal Ref #	Title of Research Project: Exposing novel epigenetic variation by manipulation of the plant DNA methylome.
6	

Project Leader: Amir Sherman	Email : **asherman@agri.gov.il** Phone : 972-50-6220-740

Institute: Plant Sciences

Department: Genomic unit

The research team (other scientists): Tzahi Arazi, Ron Ophir

Short Description of Research Project (3-5 lines):

Scientific abstract –

Epigenetics is defined as a change in gene expression without DNA sequence alteration. This variation is mediated by epigenetic marks that affect chromatin structure. In this research project we suggest to change the landscape of the plant methylome by overexpression of foreign genes in Arabidopsis that will increase the level of methylation at the DNA level. We predict that this approach will enrich the repertoire of epigenetic marks creating a new set of biological phenotypes and can revolutionize the epigenomics studies in plants.

Required Qualifications of Visiting Scientist:

Education: PhD in the following disciplines: Plant genetics, Plant genomics, *Plant physiology and biochemistry.*

Scientific Experience: Advanced molecular biology skills, worked with plants before.

Advantage to strong background in genetics.

Abilities and Skills: Highly motivated person with ability to run an independent research.

Internal Ref #	Title of Research Project:
7	Broadening the genetic range of white Cala lily (*Zantedeschia aethiopica*) through mutagenesis and genetic transformation

Project Leader: **Iris Yedidia**	Email : irisy@volcani.agri.gov.il Phone : 972-3-9683387

Institute: Agricultural Research Organization, ARO

Department: Institute of Plant Science, Ornamental Flower Department

The research team (other scientists): Dr. Tzahi Arazi, Dr. Michal Shamir, Prof Rina Kamentsky

Short Description of Research Project (3-5 lines):

The arum lily (also known as calla lily), *Zantedeschia aethiopica* (L.) Spreng., is one of the world's most iconic and widely-known plants, with a pure white funnel-like spathe enclosing the central pale yellow finger-like spadix and brilliant flowers.

Unlike the colored *Zantedeschia* which contain 6 species and thousands of hybrids, white *Zantedeschia* include about two dozen cultivars which were obtained mainly by selection from domestic and wild accessions during cultivation. In order to broaden the available genetic material of *Z. aethiopica* for flower and pot plant production, we decided to use two highly recognized techniques in plant breeding: mutagenesis with gama-radiation; and genetic transformation with selected genes. Propagation of the genetic material will be performed using rhizome divisions, seed production and development of an efficient micropropagation protocol for this plant, which is currently not available.

Required Qualifications of Visiting Scientist:

Education: PhD.

Scientific Experience: Biotechnology, specialization in plant molecular biology, Agrobacterium mediated genetic transformation of monocots, tissue culture

Abilities and Skills: somatic embryogenesis; *Agrobacterium*-mediated genetic transformation of different plant species; gene isolation and cloning; gene expression; and high level of scientific writing and data analysis

Internal Ref # 8	Title of Research Project: Development of NIR (near infrared) equations for quantification of structural and biochemical components in willow (*Salix* spp.) forage

Project Leader: Dr. Serge (Yan) Landau	Email : vclandau@volcani.agri.gov.il Phone : 0506-220492

Institute: Plant Sciences

Department: Agronomy and Natural Resources

The research team (other scientists): Dr. Joshua D. Klein (Plant Sciences); Dr. Hassan Azaizeh (Galilee Research Institute)

Short Description of Research Project (3-5 lines):

Salix spp. is a potential native source of nutritious and antihelminthic forage for sheep and goats, since it contains salicylic acid, tannins, fiber, phenols, saponins, and antioxidative compounds. Using biochemical methods to develop and validate NIRs equations to quantify these compounds in willow will greatly simplify analysis and adoption of *Salix* forage for small ruminants.

Required Qualifications of Visiting Scientist:

Education: Analytical chemistry/biochemistry/plant biochemistry/animal nutrition

Scientific Experience: Biochemical/spectrophotometric analysis of plant tissues

Abilities and Skills: Spectrometry, HPLC, methods of plant tissue chemical analysis; good English communication skills

Internal Ref # **9**	Title of Research Project: **Genetics and classical breeding of aromatic plants**
Project Leader: **Nativ Dudai**	Email : **nativdud@gmail.com** Phone : +972 5 220010
Institute: Plant Science/ Newe Ya'ar Research Center Department: Vegetible Research, The unite of Aromatic and Medicinal Plants	
The research team (other scientists): Nativ Dudai, David Chaimovitsh	
Short Description of Research Project (3-5 lines): Classical breeding and research the mechanism of inheritance of the volatiles composition in aromatic plants.	
Required Qualifications of Visiting Scientist: *Education:* PhD *Scientific Experience:* Breeding and/or chemical analyses *Abilities and Skills:* Knowledge in statistics and Mendlean genetics	

Internal Ref # **10**	Title of Research Project: **Molecular parameter that control of shoot regeneration**

Project Leader: **Moshe Reuveni**	Email : **vhmoshe@agri.gov.il** Phone : 972-3-9683830

Institute: **Plant Sciences**

Department: **Ornamental Horticulture**

The research team (other scientists):

Short Description of Research Project (3-5 lines):

We identified some physiological processes that are required for shoot regeneration. We would like to identify the molecular components that are part of these processes.

Required Qualifications of Visiting Scientist:

Education: Ph.D.

Scientific Experience: A molecular biology lab experience.

Abilities and Skills: Molecular biology, Yeast work

Internal Ref # **11**	Title of Research Project: **Leakage of biocide materials from agricultural fields and pollutant dispersion by wind and water, to natural and urban spaces.**

Project Leader: Dr. Eli Zaady	Email : **zaadye@volcani.agri.gov.il** Phone : +972 8 9928658

Institute: Agricultural Research Organization

Department: Natural Resources

The research team (other scientists):
Dr. Shlomo Sarig, Dr. Yitzchak Katra.

Short Description of Research Project (3-5 lines):

The subject is in range of ecology - soil - geomorphology. Innovative practices that combine field measurements and laboratory tests for the characterization of materials.

Required Qualifications of Visiting Scientist:

Education:

PhD in one of the fields: agro-ecology, Geography/Geomorphology, ecology of open spaces, soil sciences.

Scientific Experience:

Solid background in ecology,
Laboratory and field work.
Computer skills [Statistical analyses, Microsoft office]

Abilities and Skills:

Hard working, enthusiasm, flexibility and ability to work in research team in multiple domains in full cooperative.

Internal Ref # **12**	Title of Research Project: **Peroxidase mediated in planta anthocyanin degradation in plants**

Project Leader: Michal Oren-Shamir	Email : **vhshamir@agri.gov.il** Phone : 972-3-9683840

Institute: Volcani Center

Department: Ornamental Horticulture

The research team (other scientists):

Short Description of Research Project (3-5 lines):

Anthocyanins are the largest group of plant pigments ranging in color from red to violet and blue. They are often degraded at specific developmental stages or as a consequence of changes in environmental conditions, suggesting that this process is controlled and induced when beneficial to the plant and involves enzymatic activity. We have shown that vacuolar peroxidase are involved in this process in the Solanacere flowers Brunfelsia calycina, changing color from purple to white. We plan to continue this study, characterizing the degrading enzyme and testing its activity by silencing this gene in Brunfelsia flowers and preventing the whitening of the flowers, and by overexpressing it in petunia flowers and causing degradation of the pigments.

Required Qualifications of Visiting Scientist:

Education: PhD

Scientific Experience: experience in molecular biology and cloning, as well as experience in transformation of plants.

Abilities and Skills: skilled in working with plants, tissue cultures and knowledge in molecular biology.

Internal Ref # **13**	Title of Research Project: **The control of citric acid accumulation in citrus fruit**

Project Leader: Avi Sadka	Email : vhasadka@volcani.agri.gov.il Phone : 050-6220340

Institute: Plant Science

Department: Fruit Trees Sciences

The research team (other scientists):

Short Description of Research Project (3-5 lines):

Accumulation of citric acid is a major determinant of maturity and fruit quality in citrus. In recent years, much knowledge has been gained about citrate metabolism and its transport mechanisms across membranes, however, the regulation of acid accumulation in citrus fruit, together with the physiological role of many enzymes are still enigmatic for the large part. The proposed research aims at achieving a better understanding of the controlling points of citrate accumulation.

Required Qualifications of Visiting Scientist:

Education:

Ph.D. in plant sciences

Scientific Experience:

Molecular cloning, enzymology

Abilities and Skills:

Internal Ref # **14**	Title of Research Project: Physiology and genetics of drought tolerance in pine trees

Project Leader: Rakefet David-Schwartz	Email : **rakefetd@volcani.agri.gov.il** Phone : 972-50-6220575

Institute: **Plant Sciences**

Department: Agronomy and Natural Resources

The research team (other scientists):

Short Description of Research Project (3-5 lines):

Aleppo pine (*Pinus halepensis* Miller) is the most widely spread pine in the Mediterranean region and is well known for its eco-physiological capabilities for drought tolerance. We have identified trees with potential tolerance to semi-arid conditions and propagated these trees through vegetative propagation. We aim to analyze the propagated clones for their physiological response to drought and to identify genetic factors for drought tolerance. The final goal is to use the successful genotypes for forest renewal and for seed orchard establishment.

The project would mainly involve physiological measurements and molecular marker analysis.

Required Qualifications of Visiting Scientist: Highly motivated with a strong academic record and fluent English language skills.

Education: PhD in Plant Sciences.
Scientific Experience: Experience in: plant physiology measurements, phenotyping and genotyping, molecular genetics and statistical analysis.
Abilities and Skills: Ability to establish effective working relationships. Skilled in technical proficiency, scientific creativity, collaboration with others and independent thought.

Internal Ref # **15**	Title of Research Project: **Molecular control of acid accumulation in fleshy fruits**

Project Leader: Dr. Arthur Schaffer	Email : vcaris@agri.gov.il Phone : **972-38683646**

Institute: Plant Sciences

Department: Vegetable and Field Crops Research

The research team (other scientists):

Short Description of Research Project (3-5 lines):
Acidity is a major determinant of fruit quality. We are identifying genetic variability for fruit acidity among tomatoes and melons and studying the genetic and molecular control of this variability.

Required Qualifications of Visiting Scientist:
Education: Ph.D. in molecular plant biology

Scientific Experience: Experience with molecular and bioinformatic techniques

Abilities and Skills: bench and computer skills

Internal Ref # **16-18**	Title of Research Project: 1. Genetic and physiology of plant root architecture: hormonal control and utilization of nutrients 2. Plant-microbe interactions: mycorrhizal symbiosis in agronomical crops, rhizosphere biology 3. Management of the parasitic plants in crop roots

Project Leader: Prof. Yoram Kapulnik	Email : kapulnik@agri.gov.il Phone : 972-3-9683461

Institute: ARO, Volcani Center

Department: Plant Sciences

The research team (other scientists):

Short Description of Research Project (3-5 lines):

The research will be focused on aspects of genetic and physiology of plant root architecture will be studied in relation to hormonal control and utilization of nutrients and in relation to management of the parasitic plants in crop roots. Also, studies will be done on symbiosis systems: the Plant-microbe interactions of mycorrhizal symbiosis in agronomical crops in relation to rhizosphere biology.

Required Qualifications of Visiting Scientist:

Education: PhD

Scientific Experience: Plant molecular biology and physiology

Abilities and Skills: Precision, background in statistics, will and ability for a dedicated work

SOIL, WATER & ENVIRONMENTAL SCIENCES INSTITUTE

Internal Ref # **19**	Title of Research Project: **Understanding mechanisms of fruit tree tolerance to salinity**

Project Leader: **Dr. Alon Ben-Gal**	Email : bengal@agri.gov.il Phone : **972-8-9928644**

Institute: Gilat Research Center, Soil Water and Environmental Sciences

Department: Environmental Physics and Irrigation

The research team (other scientists): Dr. Uri Yermiyahu (ARO), Dr. Arnon Dag (ARO)

Short Description of Research Project (3-5 lines): We will utilize automated platforms for growing perennial Mediterranean fruit trees under controlled conditions of soil water salinity. The platforms allow in depth investigation of physiological response of the trees to salinity and to mechanisms of salt tolerance.

Required Qualifications of Visiting Scientist:

Education: Ph. D. in biology / soil sciences / agronomy

Scientific Experience: Fruit tree physiology / plant behavior under stress-causing conditions / evapotranspiration studies

Abilities and Skills: Fluent English, experience in physiological measurement and/or soil physics and chemistry and/or plant response modeling

Internal Ref # **20**	Title of Research Project: **Biochar interactions in the rhizosphere**

Project Leader: Dr. Ellen Graber	Email : ergraber@agri.gov.il Phone : **972-3-968-3307**

Institute: Soil, Water and Environmental Sciences

Department: Soil Chemistry and Microbiology

The research team (other scientists):

as needed

Short Description of Research Project (3-5 lines):

In the last decade, application of biochar to soil has been revealed to have important impacts on plant productivity and disease suppression, in excess of what can be explained by its influence on nutrient supply, retention, or soil water effects. The interest of our research team is in understanding the "delta" – what is it about biochar that results in these positive impacts on soil and plant productivity? The team works in a multi-disciplinary fashion: soil chemistry, microbiology, physics, plant pathology, plant nutrition, plant physiology, engineering, and more. The successful candidate will be expected to integrate into this dynamic group and participate in ongoing research according to her/his background, capabilities and interest.

Required Qualifications of Visiting Scientist:

Education:

Ph.D. in Chemistry, Soil Science, Agronomy, Plant Physiology, Molecular Biology, Microbiology, Plant Pathology, and more

Scientific Experience:

Appropriate to the discipline of the candidate

Abilities and Skills: Excellent communication skills in English, both written and spoken. Has initiative, hard-working, self-motivated, ambitious, interested in joining and contributing to a team working at the leading edge of biochar science

Internal Ref # **21**	Title of Research Project: **Rhizosphere Microbiology**

Project Leader: **Dror Minz**	Email : minz@volcani.agri.gov.il Phone : 972-3-9683316

Institute: Soil, Water and Environmental Sciences

Department:

The research team (other scientists): none

Short Description of Research Project (3-5 lines):
Root and rhizosphere microbiome is crucial for plant health and growth. The project aims at understanding the important organisms in this complex community and their role in the microbiome-plant interaction on the community and genetic level. Will include isolation of microorganisms and genetic transformation of selected isolates to manipulate plant-microbe interaction.

Required Qualifications of Visiting Scientist:
Education: PhD in microbiology

Scientific Experience: "classical" microbiology and molecular microbiology. Need previous experience in bioinformation, real-time PCR and cloning.

Abilities and Skills: understanding environmental microbiology and microbial ecology

Internal Ref # **22**	Title of Research Project: Assessing impact of anthropogenic activities on horizontal gene transfer of mobile antibiotic resistance genes from soil to bacterial pathogens

Project Leader: Eddie Cytryn	Email : eddie@volcani.agri.gov.il Phone : **972-3-9683767**

Institute: Soil, water and environmental sciences

Department: Soil Chemistry, Plant Nutrition and Microbiology

The research team (other scientists): Jie Feng (Chinese Academy of Sciences); Shelly Druyan (Volcani Center)

Short Description of Research Project (3-5 lines):

Recent studies have indicated that many pathogen-associated antibiotic resistant genes originated in soils and that increased anthropogenic activity may enhance the transfer of these genes to humans. This study will assess the impact of manure-amendment on horizontal gene transfer of mobile antibiotic resistance genes from soil to model bacterial pathogens using a combination of state-of the art genetic, genomic and culture based analyses.

Required Qualifications of Visiting Scientist:

Education:

PhD

Scientific Experience:

Microbiology, molecular biology, genomics, bioinformatics, ecological modeling

Abilities and Skills:

Strong work ethic, good personal skills, previous experience writing scientific publications and proposals in English

POSTHARVEST AND FOOD SCIENCE INSTITUTE

Internal Ref # **23**	Title of Research Project: **The involvement of RNases and nucleases in senescence, abscission and programmed cell death processes in plants.**
Project Leader: **Amnon Lers**	Email: **alers@volcani.agri.gov.il** Phone: **03-9683608**
Institute: **Postharvest and Food Science** Department: **Postharvest Science of Fresh Produce**	
The research team (other scientists):	
Short Description of Research Project (3-5 lines): **The T2 RNases and type I nucleases are highly conserved enzymes, found in a wide variety of organisms but their specific biological functions are largely unknown. RNases and nucleases were hypothesized to be involved in senescence and programmed cell death (PCD) processes in plants. We investigate the function and regulation of a tomato T2-RNase in senescence and PCD and had found it is also involved with abscission in which PCD was found to occur as well. In parallel the regulation and cellular localization of an Arabidopsis type I nuclease was characterized. Research is conducted, in both tomato and Arabidopsis, to study the specific function/s of these nucleic acid degrading enzymes in senescence, abscission and PCD and the regulatory mechanism which governs the expression of their encoding genes.**	
Required Qualifications of Visiting Scientist: *Education:* **Ph.D. in plant biology or in biochemistry & molecular biology** *Scientific Experience:* **Experience in molecular biology and plant physiology.** *Abilities and Skills:* **Good English, highly motivated, good learning capabilities and independence in research work.**	

Internal Ref # **24**	Title of Research Project: **Improving banana transformation and application of new transformation technologies.**

Project Leader: Haya Friedman	Email : hayafr@agri.gov.il Phone : **972-50-6220624**

Institute:
Postharvest and Food Sciences
Department:
Postharvest Science of Fresh Produce

The research team (other scientists):

Short Description of Research Project (3-5 lines):
Banana is an important staple food, but it is not amenable to classical breeding. Hence, technologies for evaluating gene function in banana or application of new technologies of targeted mutagenesis would be valuable for this crop. Our immediate aim is to modify fruit ripening via modulation of MaMADS box genes. Any knowledge on this would aid in extending shelf life, benefiting mainly small- scale farmers in developing countries.

Required Qualifications of Visiting Scientist:
Education:
Ph.D. in plant physiology and molecular biology
Scientific Experience:
Tissue culture is beneficial
Abilities and Skills:
Curiosity and hard working

Internal Ref # **25**	Title of Research Project: **Mechanism of biofilm formation by *Bacillus* species within dairy-associated environments**

Project Leader: Moshe Shemesh	Email : moshesh@agri.gov.il Phone : 972-3-8683868

Institute: Postharvest Technology and Food Sciences

Department: Food Quality and Safety

The research team (other scientists):

Short Description of Research Project (3-5 lines):

Bacillus species which are major contaminants of dairy products can form structured multicellular communities known as biofilms on virtually all types of contact surfaces, from milk cups on the dairy farm to heat exchangers in the processing plant. Despite being a major problem in the dairy industry, the mechanism by which *Bacillus* species form biofilms within milk has remained largely uncharacterized. Thus the goal of the project is to understand the molecular mechanism of biofilm formation of *Bacillus* species within milk.

Required Qualifications of Visiting Scientist:

Education:

PhD in Microbiology or Food Microbiology.

Scientific Experience:

Significant record of scientific publications in Microbiology field and record of active participation in international scientific meetings.

Abilities and Skills: knowledge of basic methods in microbiology and molecular biology. Ability to independently setup experimental systems. Ability to summarize experimental results and to writing scientific papers.

Internal Ref # **26**	Title of Research Project: **Elucidation of signaling pathways that regulate ethylene-induced leaf and flower abscission in tomato plants**

Project Leader: **Dr. Shimon Meir**	Email: **shimonm@volcani.agri.gov.il** Phone: **972-3-9683667; 972-50-6220667**

Institute: **Postharvest and Food Sciences**

Department: **Postharvest Science of Fresh Produce**

The research team (other scientists): **Dr. Sonia Philosoph-Hadas**
Dr. Amnon Lers

Short Description of Research Project (3-5 lines):

We established a powerful platform for analysis of genes for regulatory proteins expressed in the tomato leaf and flower abscission zones. We identified changes in gene expression for several transcription factors (TFs) directly linked to ethylene and auxin signaling, which play a functional role in the onset of abscission. We have used several genes for transformations, and we have to complete the functional analysis of the stably transformed tomato plants and perform transcriptome analysis using custom abscission-specific microarrays.

Required Qualifications of Visiting Scientist:

Education: **Ph.D. in biology**

Scientific Experience: **Background in plant physiology, plant hormones, molecular biology, analyses of gene expression, microscopy, biochemical reactions, bioinformatics, proteomics.**

Abilities and Skills: **To conduct an independent research, including planning of the experimental system, performing the experiments and writing reports and papers; computer proficiency.**

Internal Ref # **27**	Title of Research Project: **Postharvest pathogens and Pathogenicity of Colletotrichum**

Project Leader: **Dov Prusky**	Email : **dovprusk@agri.gov.il** Phone :

Institute: **Food Technology**

Department: **Postharvest Science**

The research team (other scientists): **D. Prusky, H. Friedman, A. Lers**

Short Description of Research Project (3-5 lines):

Understanding the basic processes underlying the interactions between fruits and pathogenic fungi. Studying biochemical and molecular mechanisms that are controlling postharvest fungal virulence and fruit resistance factors. Development of transformation-mediated gene disruption strains affected in pathogenicity and with enhanced ability to modulate host pH. Studying the molecular and biochemical basis for modulation of pathogenicity of postharvest pathogens by affecting the alkalinization and acidification of the environment of infected tissue. Specifically: regulation of organic acid production and secretion; nitrogen metabolism and ammonia secretion. Effect of fungal effecting molecules on the modulation of pathogenicity, host response and program cell death.

Required Qualifications of Visiting Scientist:

Education: **PhD**

Scientific Experience: **Fungal Genetics. Host Pathogen interactions**

Abilities and Skills: **Molecular Biology**

Internal Ref # **28**	Title of Research Project: **Can cytokinin producing bacteria improve the postharvest quality of table grapes**

Project Leader: **Dr Amnon Lichter**	Email : **vtlicht@agri.gov.il** Phone : **972-3-9683684**

Institute: Institute of Postharvest and Food Sciences

Department: Postharvest Science

The research team (other scientists): Dr Dlila Beno and Mr Itay Maoz (PhD student)

Short Description of Research Project (3-5 lines):
Cytokinins are known to increase berry size in table grapes and maintain chlorophyll level of tissues undergoing senescence. Our studies show that they modulate both primary and secondary metabolism in the berries. The objective is to determine if cytokinins produced by epiphytic bacteria that colonize the cluster will modify quality parameters before harvest and after storage. This will be studied by fluorescence imaging as well as standard means

Required Qualifications of Visiting Scientist:
Education: PhD in horticulture or microbiology

Scientific Experience: experience in microbiology is essential

Abilities and Skills: English and scientific writing , independence, computer skills, practical knowledge in statistics

PLANT PROTECTION INSTITUTE

Internal Ref # **29**	Title of Research Project: **Involvement of Honey bee viruses in the collapse of Honey bee colonies**

Project Leader: Prof. Nor Chejanovsky	Email : ninar@volcani.agri.gov.il Phone : +972-3-9683694, cell-phone +972506220694

Institute: Plant Protection

Department: Entomology

The research team (other scientists): Sofia Levinson PhD student.

Short Description of Research Project (3-5 lines):

Honey bee (*Apis mellifera*) colony losses pose a severe risk to the food chain. Honey bee viruses are highly associated with colony losses. Most of the honey bee viruses are able to establish asymptomatic infections in the colony for long time periods. Exposure of the colony to stress factors leads to significant increase in viral titers and fatal infections. Our aims are: *1. To discover genetic changes in relevant honey bee viruses that may affect tissue tropism in the host, and/or virus infectivity and pathogenicity. 2. To elucidate mechanisms used by the host to regulate/ manage viral infections.*

Required Qualifications of Visiting Scientist:

Education:

PhD Degree

Knowledge of the English language. Reading, writing speaking.

Scientific Experience: PhD thesis, conduction of laboratory experimentation.

Abilities and Skills: background in insect molecular biology and virology

Internal Ref # **30**	Title of Research Project: **Studying the transcriptomic changes occurring during Root Knot Nematode infection of tomato**

Project Leader: **Dr Sigal Brown Horowitz**	Email : **sigalhor@volcani.agri.gov.il** Phone : 972-50-6220084 972-3-9683671

Institute: The Plant Protection Institute; ARO The Volcani Center

Department: The Nematology Unit, The Entomology Department and Units of Nematology and Chemistry

The research team (other scientists): --------

Short Description of Research Project (3-5 lines):

During the proposed research we will study in depth the role of genes that might be involved in feeding site development as well as plant defense mechanisms induced by the RKN. The genes will be validated by qRT-PCR, promoter:GUS fusion and manipulating gene expression level in tomato roots.

Required Qualifications of Visiting Scientist: In this project the student should function analyzing the role of differentially expressed genes in regulating Root Knot Nematode infection. The techniques will involve traditional Nematology tools as well as Molecular genetics and biochemical tools. For that purpose the studend should be familiar with Microbiology work and basic Molecular and genetic knowledge.

Education: PhD

Scientific Experience: Proven Molecular Knowledge and experience

Abilities and Skills: English speaker with proven experience in scientific writing

Internal Ref # **31**	Title of Research Project: **Computational approaches for exploring the functional significance of alternative community structures of symbiotic bacteria in whiteflies**

Project Leader: **Einat Zchori-Fein**	Email : einat@agri.gov.il Phone : **+972-4-9539549**

Institute: **Agricultural Research Organization**

Department: **Entomology, Newe Ya'ar**

The research team (other scientists):
Dr. Shiri Frielich (Bioinformatician working at Newe Ya'ar)

Short Description of Research Project (3-5 lines):
We are investigating the interactions between the sweetpotato whitefly *Bemisia tabaci* and its facultative symbionts. The aim of the project is to use the community of secondary symbionts in the bacteriome of this insect pest, as a model ecosystem for conducting comprehensive analyses of bacterial interactions and their role in shaping the ecology and evolution of their host.

Required Qualifications of Visiting Scientist:

Education:
A good background in entomology and/or plant sciences, is a must as well as a solid grip of computational tools.

Scientific Experience:
Previous experience with a diverse array of molecular techniques (PCR, RT-PCR etc.) is required, as well as a good experience in rearing plants and insects (preferably phytophagous ones) and working with plants and insects. Experience with high level bioinformatic tools will be an advantage.

Abilities and Skills:
We will be looking for an independent individual, who will be capable of applying a diverse array of methods (including molecular, microscopy and computer work) as well as innovative thinking. The candidate should be willing and able to learn and assimilate new technologies, and able to collaborate with other team members.

Internal Ref # **32**	Title of Research Project: Mechanism of induced resistance to insect pests (*B. tabaci* and *P. latus*) in leafy green vegetables (lettuce, rocket, coriander)

Project Leader: Dr. Phyllis G. Weintraub	Email : phyllisw@volcani.agri.gov.il Phone : 050-6220-170

Institute: Plant Protection

Department: Entomology

The research team (other scientists):
Dr.Joshua D. Klein (Institute of Plant Sciences)

Short Description of Research Project (3-5 lines):

Seed treatment of leafy green vegetables with jasmonic or salicylic acid results in fewer insect pests on the resulting seedlings, but the mechanism is unknown. Treatment effects on growth and development of *Bemisia tabaci* and *Polyphagotarsonemus latus* from eggs to adults, and on physiological feeding responses, will be studied during development of treated and non-treated plants at two-week intervals.

Required Qualifications of Visiting Scientist:
Education: Insect physiology and/or feeding behavior

Scientific Experience: Biological/chemical/physical control of insect and mite pests

Abilities and Skills: Microscopy (including staining techniques); experience with insect feeding experiments; good English communication skills

Internal Ref # **33**	Title of Research Project: Role of strigolactones in plant defense mechanism

Project Leader: Dr. Joseph Hershenhorn	Email : josephhe@volcani.agri.gov.il Phone : 050-6220034

Institute: Newe Ya'ar Research Center, Agricultural Research Organization

Department: Department of Phytopathology and Weed Research

The research team (other scientists): Dr. Evgenia Dor, Dr. Shmuel Galili

Short Description of Research Project (3-5 lines):
Sensitivity to plant disease of tomato mutants lacking strigolactones compared wild type will be tested. A signal transduction and biosynthetic processes associated with formation barriers to prevent parasites infection and pathways involved in response to oxidative stress, signaling pathways for secondary metabolism, pathways involved in multiple plants biosynthetic and chemical detoxication processes, as well as analysis of gene expression in the roots of wild type and mutant plants will be studied.

Required Qualifications of Visiting Scientist:
Education: Ph. D. in Biotechnology

Scientific Experience: specialization in Enzimology, Molecular biology, Genetic Engineering, Phytopathology

Abilities and Skills: Ability to analyze enzymes, to work with fungi, to conduct gene expression analysis.

Internal Ref # **34**	Title of Research Project: **Deciphering protein interactions between the whitefly *Bemisia tabaci*, its secondary endosymbionts and *Tomato yellow leaf curl virus***

Project Leader: **MURAD GHANIM**	Email : **ghanim@agri.gov.il** Phone : **050-6220347**

Institute: **PLANT PROTECTION**

Department: **ENTOMOLOGY**

The research team (other scientists):

Short Description of Research Project (3-5 lines):

The research will focus on the identification of proteins that govern specific interactions between the whitefly *Bemisia tabaci,* a cosmopolitan insect pest and virus vector, and *Tomato yellow leaf curl virus,* a devastating virus that infects tomato and exclusively transmitted by *B. tabaci.* Those virus-vector interactions involve a third player: bacterial endosymbionts of *B. tabaci* that were shown to influence these interactions.

Required Qualifications of Visiting Scientist:

Education: AGRICULTURE, BIOLOGY, BIOTECHNOLOGY OR RELATED SUBJECTS

Scientific Experience: KNOWLEDGE IN MOLECULAR BIOLOGY TECHNIQUES, MOLECULAR CLONING, PCR, QPCR, ETC.

Abilities and Skills: INTERACT WITH OTHER COLLEAGUES AND STUDENTS IN THE LAB, WORK IN A GROUP.

Internal Ref # **35**	Title of Research Project: **Viruses in potato crops**

Project Leader: **Victor Gaba**	Email : **vpgaba@volcani.agri.gov.il** Phone : 0506-220769

Institute: Plant Protection

Department: Plant Pathology

The research team (other scientists): Amit Gal-On, Moshe Lapidot, Noa Sela

Short Description of Research Project (3-5 lines):
World-wide potato is the number 4 crop. The major virus infecting potato world-wide is now *Potato virus Y* (PVY), which is vectored by a number of aphids. "Seed" potatoes imported to Israel annually bring a low-level of virus infection. There is also PVY present in the local fields. We are interested in how PVY infects the Israeli potato crop from these 2 sources, and which source is most important under non-epidemic and epidemic conditions. Virus strains will be isolated and sequenced, including by "deep sequencing". Bio-informatic studies will be made.

Required Qualifications of Visiting Scientist:
Education: Ph.D. (submitted)

Scientific Experience: Good working knowledge of molecular biology required, preferably Plant Virology background, Plant Pathology also acceptable, although other areas of experience acceptable.

Abilities and Skills: Excellent working knowledge of molecular biology required. Must be able to work with a team. Must be prepared to learn.

Internal Ref # **36**	Title of Research Project: Effectors of Egyptian broomrape against defense mechanisms of tomato plants

Project Leader: Dr. Evgenia Dor	Email : josephhe@volcani.agri.gov.il Phone : 050-6220034

Institute: Newe Ya'ar Research Center, Agricultural Research Organization

Department: Department of Phytopathology and Weed Research

The research team (other scientists): Dr. Joseph Hershenhorn, Dr. Shmuel Galili

Short Description of Research Project (3-5 lines):
Signaling between broomrape and tomato plants on the first stages of parasitism will be studied. Effectors released by parasite in order to block a biosynthetic processes associated with formation barriers to prevent parasites infection will be identified.

Required Qualifications of Visiting Scientist:
Education: Ph. D. in Environment Science

Scientific Experience: specialization in Enzimology, plant defense mechanisms

Abilities and Skills: Ability to analyze enzymes, to work with fungi, to conduct gene expression analysis.

Internal Ref # **37**	Title of Research Project: **Widespread involvement of phytopathogenic fungi from the *Botryosphaeria* complex in dieback and mortality of fruit trees**

Project Leader: **Stanley Freeman**	Email : **freeman@volcani.agri.gov.il** Phone : 0506-220537

Institute: Plant Protection

Department: Plant Pathology and Weed Research

The research team (other scientists): **Omer Frenkel, David Ezra**

Short Description of Research Project (3-5 lines):

Avocado and other fruit crops have been heavily affected in Israel by fungi from the *Botryosphaeria* complex. The fungus is hypothesized to originate from propagation material selected from mother plants in infected orchards. The fungus further affects nursery material and thereafter plant material following distribution in the field. Molecular biology tools are envisaged to be used to discern where and when the pathogen isolates and population(s) are originating from during the multiplication processes.

Required Qualifications of Visiting Scientist:

Education: PhD with proven track record experience below

Scientific Experience: Experience in molecular ecology of microorganisms or genetics of population using molecular tools.

Abilities and Skills: Preference will be given to candidates with a track record in the development of **molecular genetic markers** for discerning populations, with experience in plants/pathogens of plants

ANIMAL SCIENCES INSTITUTE

Internal Ref # **38**	Title of Research Project: **Plasmids and horizontal gene transfer**

Project Leader: **Itzhak Mizrahi**	Email : **itzhakm@agri.gov.il** Phone : 97239683751 Lab site: http://app.agri.gov.il/mizrahilab

Institute: **Animal Science,**

Department: Ruminant Science

The research team (other scientists):

Short Description of Research Project (3-5 lines): Our exploration of the overall plasmid population within the complex microbial habitat of the rumen suggest that in this habitat, the plasmids have certain hereditary characteristics—as they recur and are acquired at different locations and time points, while serving as a channel for the exchange of rumen-advantageous functions between the rumen microbes. We are now exploring these notions in order to investigate the role and function of plasmids at the community level.

Required Qualifications of Visiting Scientist:

Education: Excellent (top 10%) PhD graduates in microbial ecology or microbiology or bioinformatics (at list two first author articles in peer reviewed journals). Excellent verbal, writing and reading abilities in English.

Scientific Experience: microbial ecology AND/OR molecular microbiology AND/OR classical microbiology AND/OR bioinformatics (programing capabilities in python or perl and matlab or R)

Abilities and Skills: Obligatory-proven good article writing skills, classical microbiology (with preference to anaerobic microbiology) and molecular microbiology AND/OR microbial ecology technics (FISH, SIP etc) AND/OR programing capabilities in python OR perl and matlab or R with experience in bioinformatic analysis.

Internal Ref # **39**	Title of Research Project: **Rumen Methanogens**

Project Leader: **Itzhak Mizrahi**	Email : **itzhakm@agri.gov.il** Phone : 97239683751 Lab site: http://app.agri.gov.il/mizrahilab

Institute: **Animal Science,**

Department: Ruminant Science

The research team (other scientists):

A large part of the Archaea population in the rumen is made up of anaerobic methanogens. Methanogens produce CH4 by either reducing CO2 or dissimilating acetate to CH4 and CO2. In the rumen most of the CH4 is produced via reduction of CO2 through utilization of hydrogen for carbon dioxide reduction, although formate, methanol and methylamines are also used by some methanogenic species. The methane is eructated into the atmosphere along with its retained energy, which is lost from the cow's reticulorumen. This process results in a loss of 5 to 19% of the energy content of the feed and has wide environmental implications as a very potent greenhouse gas. Several projects in the lab are involved with characterization of rumen methanogens using culturing methods as well as molecular tools and next generation sequencing methods

Required Qualifications of Visiting Scientist:
Education: Excellent (top 10%) PhD graduates in microbial ecology or microbiology or bioinformatics (at list two first author articles in peer reviewed journals). Excellent verbal, writing and reading abilities in English.

Scientific Experience: microbial ecology AND/OR molecular microbiology AND/OR classical microbiology AND/OR bioinformatics (programing capabilities in python or perl and matlab or R)
Abilities and Skills: Obligatory-proven good article writing skills, classical microbiology (with preference to anaerobic microbiology) and molecular microbiology AND/OR microbial ecology technics (FISH, SIP etc) AND/OR programing capabilities in python OR perl and matlab or R with experience in bioinformatic analysis.

Internal Ref # **40**	Title of Research Project: **Rumen Bacteria**

Project Leader: **Itzhak Mizrahi**	Email : **itzhakm@agri.gov.il** Phone : 97239683751 Lab site: http://app.agri.gov.il/mizrahilab

Institute: **Animal Science,**

Department: Ruminant Science

The research team (other scientists):

Bacteria make up the largest domain in the rumen ecosystem and their presence is vital for the animal's well-being. They are responsible for most of the degradation and fermentation of plant mass in the rumen. A concentration of approximately 1011 bacteria/ml exists in the rumen, and their populations are considered highly complex in terms of taxon identity and functionality. The coordinated and complex metabolic interactions between the different bacterial taxa enable efficient utilization of the consumed plant fiber and maximal energy consumption by the overall rumen microbiota. The projects in the lab are involved in understanding the composition of this domain and it's genetic architecture using both classical and metagenomic approaches as a function of different changing parameters and also its effect on the rumen metabolic parameters and the animal host

Required Qualifications of Visiting Scientist:

Education: Excellent (top 10%) PhD graduates in microbial ecology or microbiology or bioinformatics (at list two first author articles in peer reviewed journals). Excellent verbal, writing and reading abilities in English.

Scientific Experience: microbial ecology AND/OR molecular microbiology AND/OR classical microbiology AND/OR bioinformatics (programing capabilities in python or perl and matlab or R)

Abilities and Skills: Obligatory-proven good article writing skills, classical microbiology (with preference to anaerobic microbiology) and molecular microbiology AND/OR microbial ecology technics (FISH, SIP etc) AND/OR programing capabilities in python OR perl and matlab or R with experience in bioinformatic analysis.

Internal Ref # **41**	Title of Research Project: **Metabolic engineering**

Project Leader: **Itzhak Mizrahi**	Email : **itzhakm@agri.gov.il** Phone : 97239683751 Lab site: http://app.agri.gov.il/mizrahilab

Institute: **Animal Science,**

Department: Ruminant Science

The research team (other scientists):

In general, plant materials are composed of organic matter such as proteins, lipids and nucleic acids and also a large proportion of carbohydrate polymers such as celluloses, hemicelluloses, pectins, fructosans, starches and other polysaccharides which are mostly indigestible for the animal. The reticulorumen microorganisms utilize specialized enzymes and enzyme complexes to degrade these polysaccharides into monomeric or dimeric sugars and subsequently ferment them. These enzymes could be harnessed to agricultural and environmental implications. We use bioinformatic tools and molecular biology to screen for such enzymes and introduce them into desired bacteria (manly lactic acid bacteria) that serve those purposes.

Required Qualifications of Visiting Scientist:
Education: Excellent (top 10%) PhD graduates in microbial ecology or microbiology or bioinformatics (at list two first author articles in peer reviewed journals). Excellent verbal, writing and reading abilities in English.

Scientific Experience: microbial ecology AND/OR molecular microbiology AND/OR classical microbiology AND/OR bioinformatics (programing capabilities in python or perl and matlab or R)
Abilities and Skills: Obligatory-proven good article writing skills, classical microbiology (with preference to anaerobic microbiology) and molecular microbiology AND/OR microbial ecology technics (FISH, SIP etc) AND/OR programing capabilities in python OR perl and matlab or R with experience in bioinformatic analysis.

AGRICULTURAL ENGINEERING INSTITUTE

Internal Ref # **42**	Title of Research Project: **Sustainable Production in Protected Cultivation via Improved Management and Control of Microclimate**

Project Leader: **Dr. Meir Teitel**	Email : grteitel@agri.gov.il Phone : **97239683515**

Institute: Agricultural Engineering

Department: Growing Production and Environmental Engineering

The research team (other scientists): Dr. Josef Tanny, Dr. Hagai Yasuor

Short Description of Research Project (3-5 lines):
The project deals with development of innovative, low cost and energy efficient houses for protected cultivation (greenhouses and screenhouses). Emphasize will be given to basic understanding of processes followed by improved design of ventilation & cooling systems. The main objective is to alleviate the high heat load and reduce high humidity which were often observed inside these houses in recent years, due to the global climate change.

Required Qualifications of Visiting Scientist:
Education: Ph.D. in Agricultural or Mechanical engineering.

Scientific Experience: The applicant should have experience in measurement of environmental parameters such as solar radiation, heat flux, temperature and humidity. A good theoretical background in engineering aspects of heat transfer and fluid mechanics is required. Knowledge and experience in computational fluid dynamics (CFD) analysis is an advantage.

Abilities and Skills: Fluent in English, good programming skills with scientific software, good background with data logging. Willingness to learn, ability to work in a scientific group, leadership and initiative character.