

Division of Natural System	Research field	Plant Physiology and Biochemistry	Lab. ID NS04
Laboratory web site	http://photon.w3.kanazawa-u.ac.jp/		
Research subjects			
<p>The cyanobacterium <i>Nostoc commune</i> adapts to terrestrial environmental conditions and has a cosmopolitan distribution on the Earth. In its natural habitats, <i>N. commune</i> forms visually conspicuous colonies that consist of extracellular matrix with filamentous cells embedded inside. <i>N. commune</i> colonies are subjected to frequent cycles of desiccation and wetting. The desiccated colonies show little to no metabolic activity, yet they retain the ability to grow for more than 100 years. Upon rehydration, <i>N. commune</i> cells rapidly recover respiration and photosynthesis. This phenomenon is termed anhydrobiosis. We are investigating molecular mechanisms of anhydrobiosis using <i>N. commune</i> that is a prokaryotic model anhydrobiote with oxygenic photosynthetic capabilities in vegetative cells and does not differentiate into akinetes (spores). (T Sakamoto) Phytopathogenic <i>Fusarium</i> species (e.g. <i>F. graminearum</i>) are the etiological agents of <i>Fusarium</i> head blight (FHB) in monocotyledonous plants such as wheat and barley. These pathogenic fungi produce trichothecene phytotoxins, which are thought to be virulence factors in the infection of plants by <i>Fusarium</i> species. <i>Arabidopsis</i> is susceptible to <i>F. graminearum</i> and <i>F. culmorum</i>, and trichothecene production was detected in <i>Fusarium</i>-infected <i>Arabidopsis</i> flowers. <i>Arabidopsis</i> is a useful model for studying the mode of action of trichothecenes in higher plants. In our study, we performed functional analysis of <i>Arabidopsis</i> proteins regulating disease resistance against trichothecene-producing <i>Fusarium</i> species. (T Nishiuchi)</p>			
Master/Doctor course: Education policy, curriculum, typical activity in the laboratory			
We have Journal Club, Progress Report and Lab Meeting weekly. You have to report your progress weekly to your adviser. Presentation at a meeting is required for a graduate student and a PhD candidate must be prepare a draft of publication. (T Sakamoto)			
Daily life in the laboratory, etc.			
Core time: M-F, 9am-5pm.			
Message or comments by the laboratory faculty staffs			
<p>First, let's clear up a common misconception. You are not here to help me with my research. Just the opposite -- I'm here to help you with yours. As you gain experience in the lab, you will take up an increasing degree of autonomy and control over your project. You are encouraged to come to ask an advice immediately when you have a trouble to be solved. Mistakes may happen while doing experiments. But, you can turn even these situations into positive experiences. The ability to successfully troubleshoot (recognizing the problem, arriving at a strategy to fix it, and devising a course of action to avoid it again) is a valuable commodity in the workforce. You will bear primary responsibility for moving the project forward. Needless to say, you will probably never reach a point (here or beyond) where you no longer need technical help or advice as to direction, and these will be offered in abundance. But the ultimate responsibility and the ultimate rewards will be yours. Be aware that working in lab is not like working in a lab for a course. The goal of research is not to teach you techniques but rather to invite you into the greater scientific community. (By Dr. Jeff Elhai at VCU and Dr. Ann Marie Daniel at Penn State, T Sakamoto)</p>			
Recent Master theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2013.3	UV-absorbing pigments and antioxidant activity in the aquatic cyanobacterium <i>Nostoc verrucosum</i> .		
Recent Doctoral theses in these 3 years (+ more if appropriate)			
year.month	Thesis title (including English translation of Japanese thesis title)		
2015.9	Development of cultivation technique for yield expansion utilizing the light signal responses of the plants		
2013.9	Multifunctional sunscreen pigments from the terrestrial cyanobacterium <i>Nostoc commune</i> .		
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