Networking as an instrument to benefit new generation of Russian biotechnologists

- **Professor Vasily Popov**
- *Voronezh State University,*
- *Dept.of Plant Physiol. Biochem.*
- ***pvn@bio.vsu.ru***

I would like to present you our study "ROLE OF PHYTOCHROME SYSTEM IN SUCCINATE DEHYDROGENASE ACTIVITY REGULATION IN GREEN LEAVES OF PLANTS".

Попов Василий Николаевич

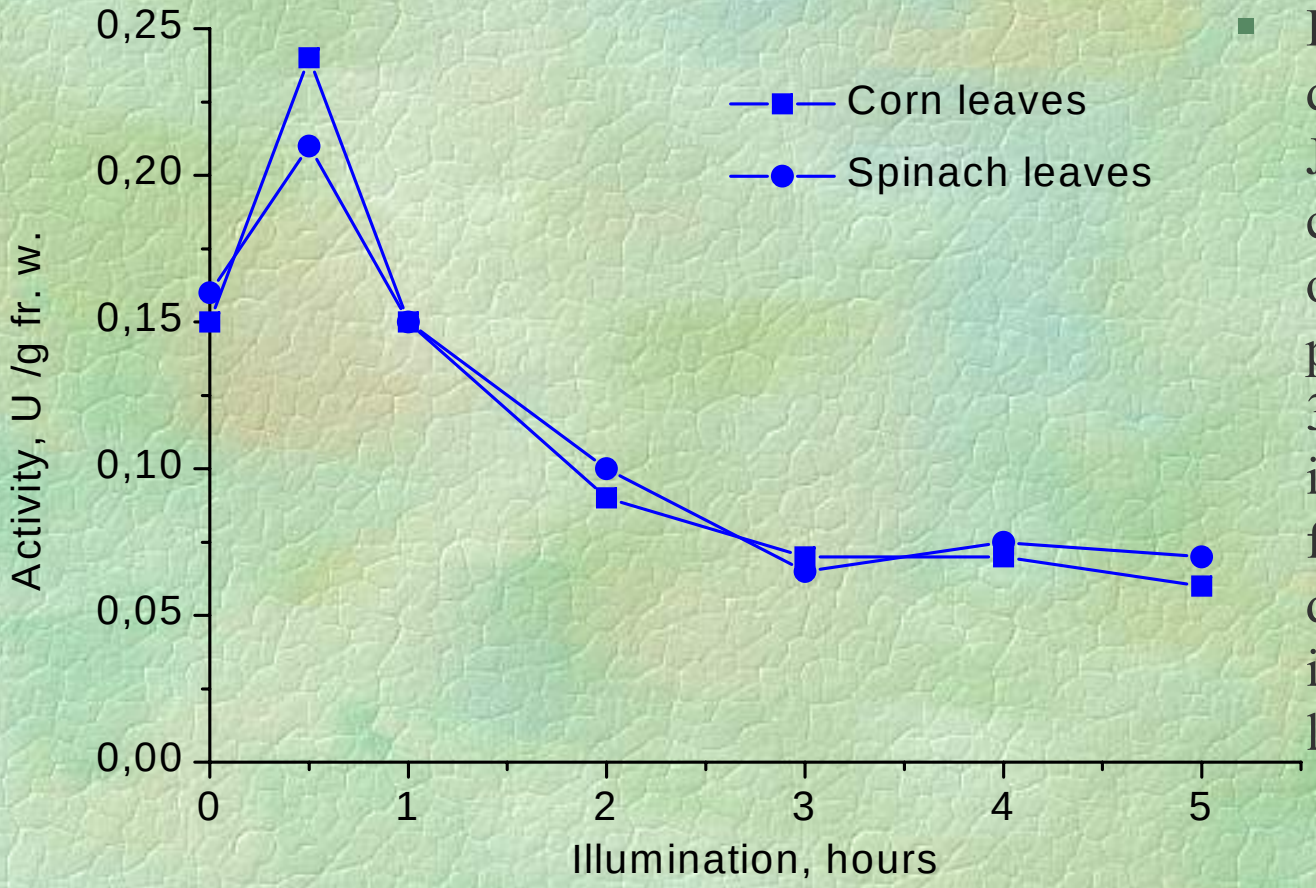
Кафедра физиологии и биохимии растений

Воронежский госуниверситет

Complex II of the ETC or succinate dehydrogenase is located in the inner membrane of mitochondria and catalyses the conversion of succinate to fumarate, resulted in ubiquinone reduction

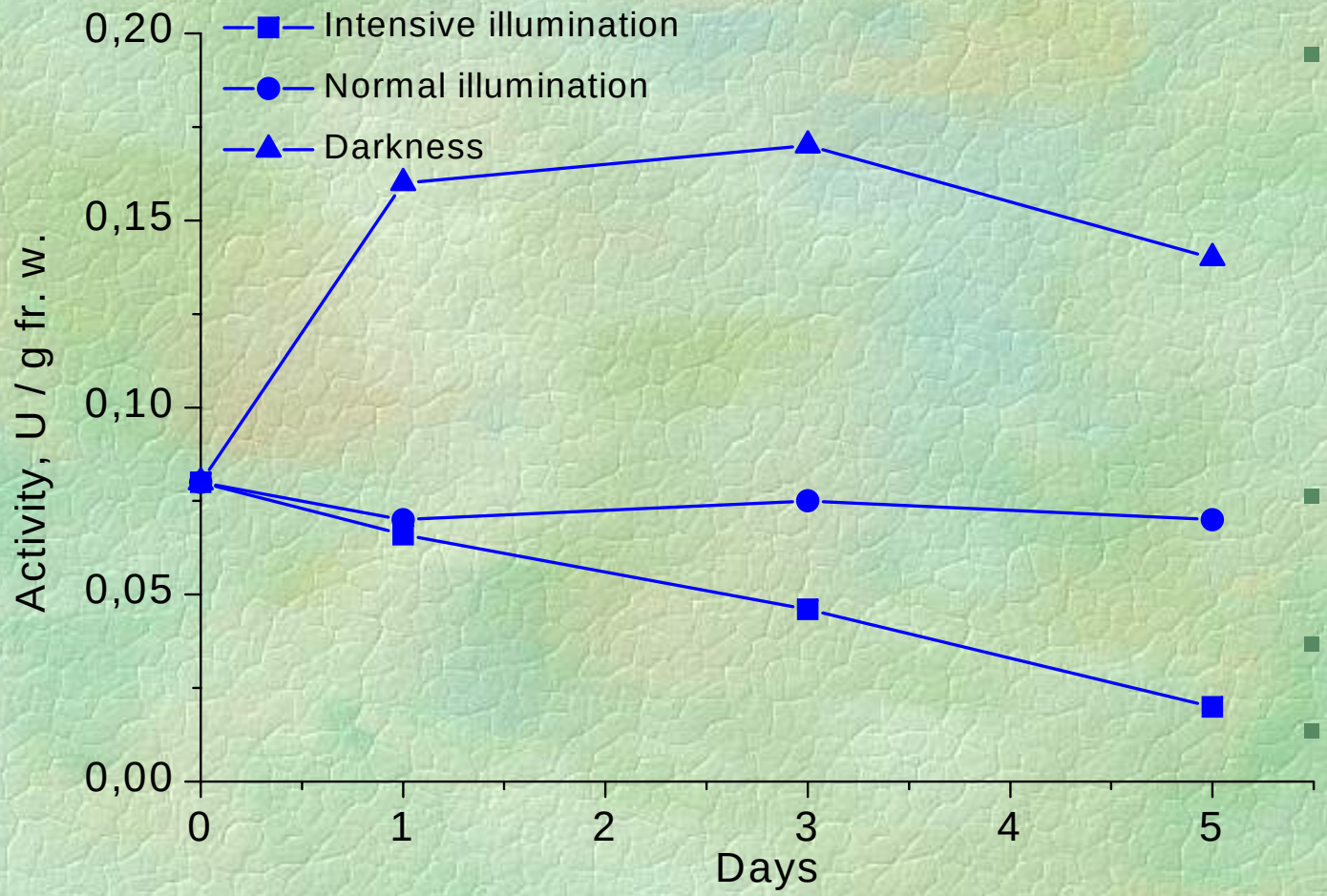
- Bioenergetics of plant cells is unique because it includes dark respiration as well as photosynthetic processes.
- A common observation is that CO_2 evolution from dark respiration is decreased under light conditions (Raghavendra et al., 1994). At the same time there is some evidence that mitochondrial respiration could participate in ATP production in the light (Gardestroem and Wigge, 1988, Kroemer et al., 1988, 1993, Igamberdiev et al., 1997).
- The accumulation of ATP and increase of transmembrane potentials causes a limitation of NADH and succinate oxidation (Chance, Williams, 1956) that reduce the amount of oxidized NAD^+. Succinate can only be oxidized by succinate dehydrogenase which acts, at the same time, as a Krebs cycle enzyme and as a component in Complex II of the electron transport chain.

The effect of light on succinate dehydrogenase (succinate:ubiquinone reductase, SUR) was studied.



- It was shown that a darkness-light (30 J $m^{-2}s^{-1}$) transition caused an increase of SUR activity in plant leaves during 30 min of incubation, followed by a decrease of activity in spinach and corn leaves.

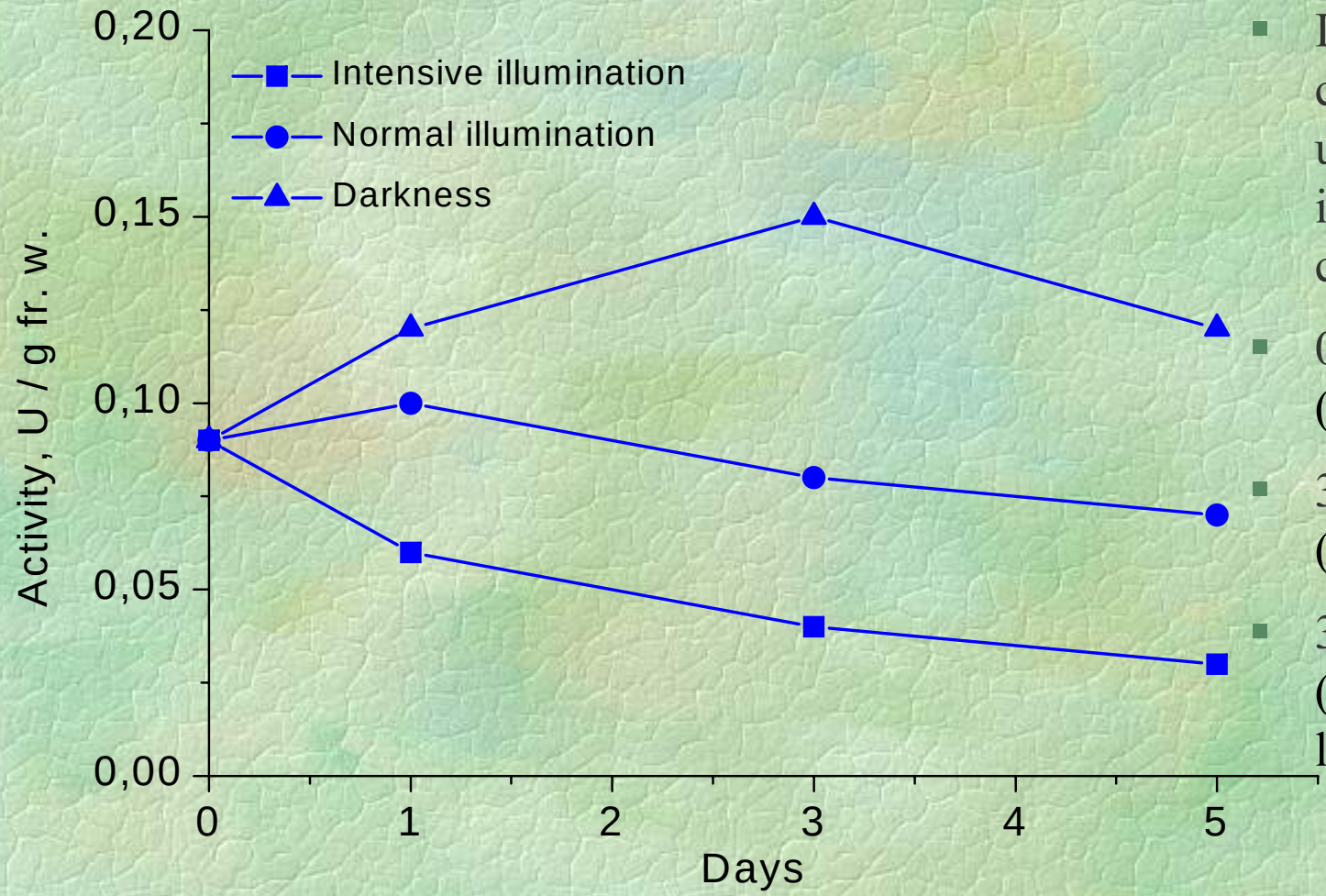
White light of high intensity (60 J $m^{-2}s^{-1}$) also reduces SUR ability in spinach leaves



- Incubation of spinach plants undo different illumination conditions

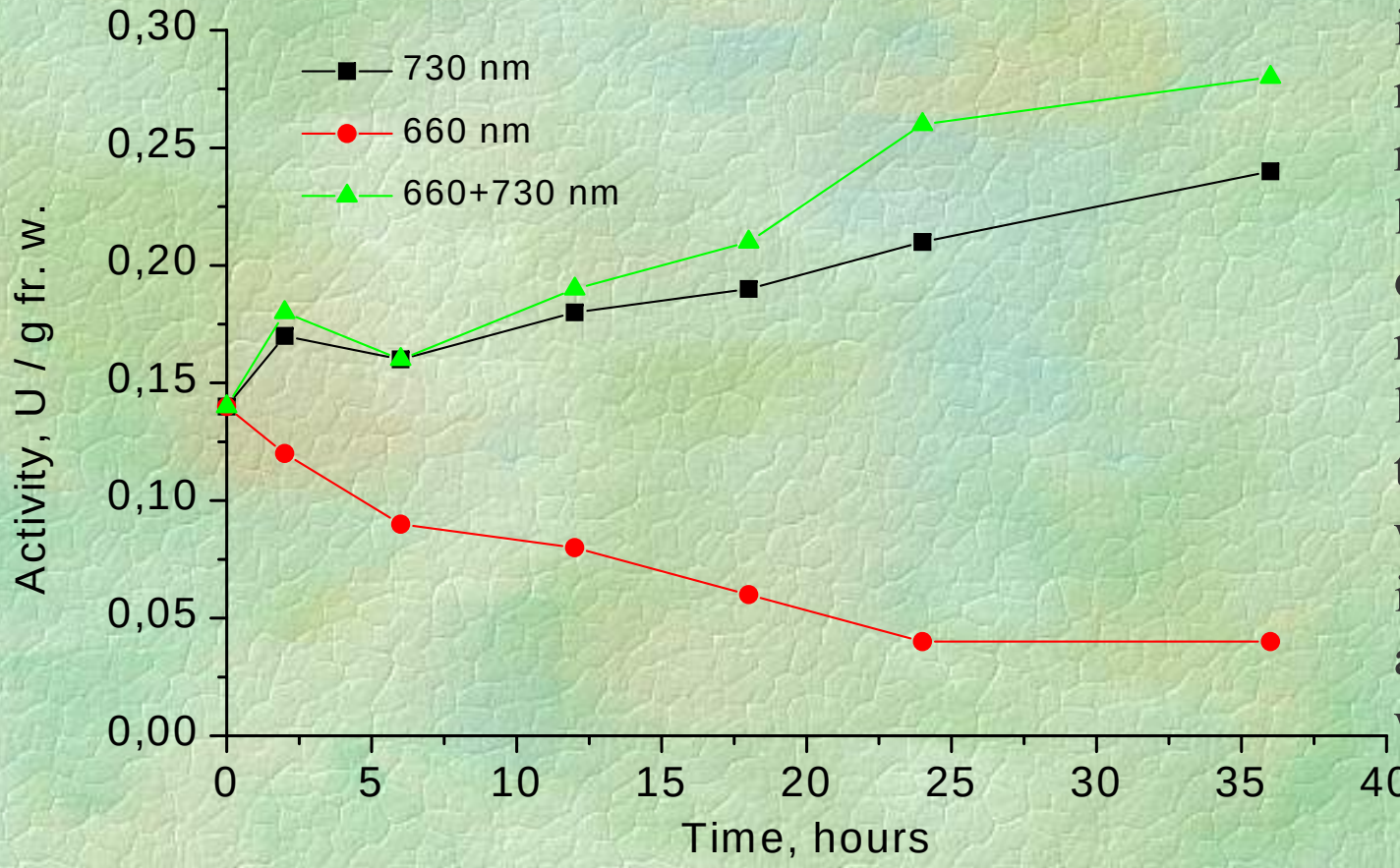
- 1. 0 J m^{-2} s^{-1} (darkness)
- 2. 30 J m^{-2} s^{-1}
- 3. 60 J m^{-2} s^{-1}

Same results were observed for corn leaves



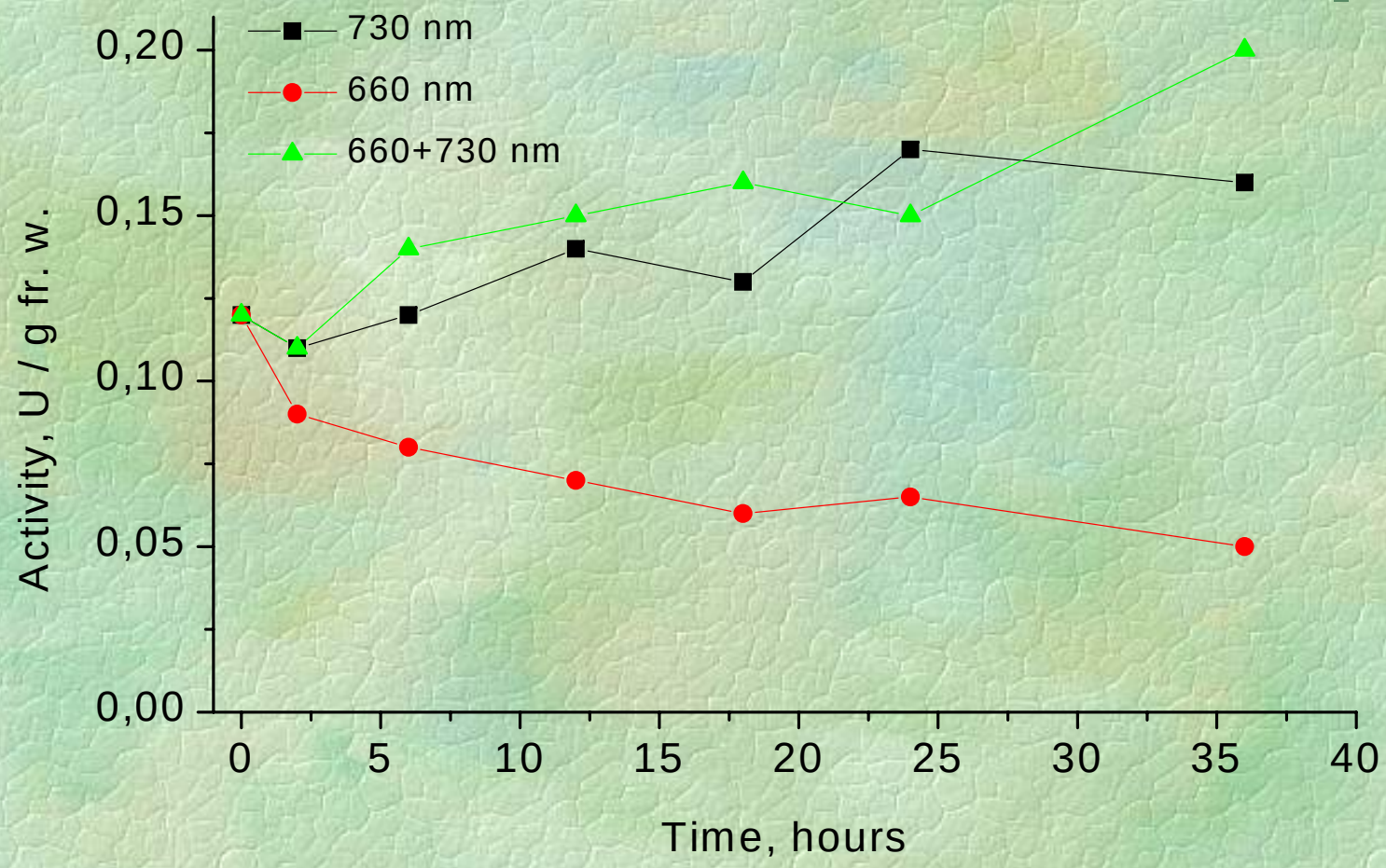
- Incubation of corn plants undo different illumination conditions
- 0 J m^{-2} s^{-1} (darkness)
- 30 J m^{-2} s^{-1} (normal light)
- 3. 60 J m^{-2} s^{-1} (intensive light)

Light of 660 nm was most effective for the induction of these effects both in spinach leaves ...



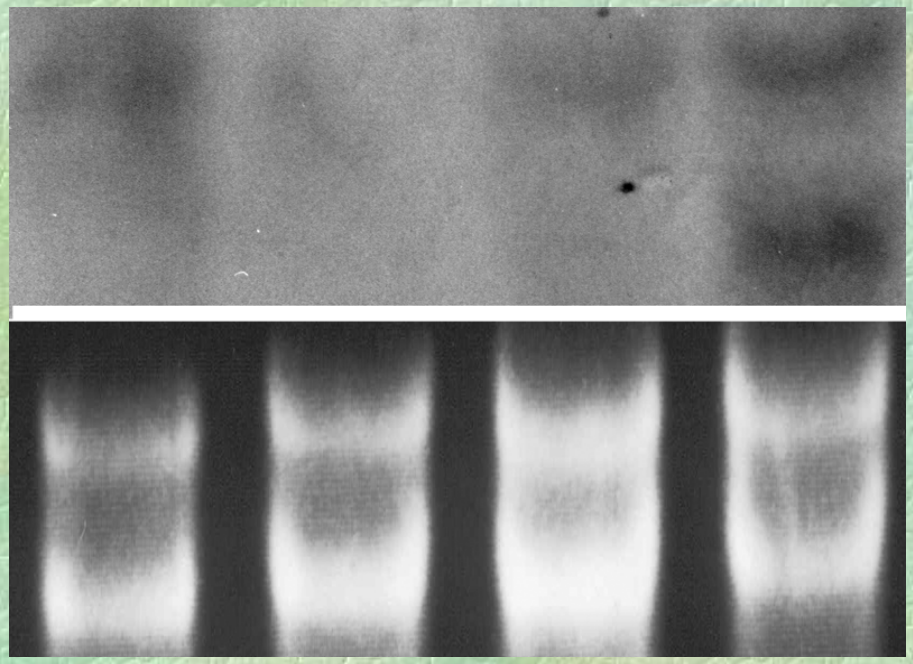
- Plants were illuminated by red (10 min), far red (10 min), light or sequence of red and far red (10+ 10 min) light. After light treatment plants were incubated in darkness and activity of SDH was measured

… and corn leaves. Blue light did not effect on succinate dehydrogenase activity.



- Plants were illuminated by red (10 min), far red (10 min), light or sequence of red and far red (10+ 10 min) light.

Red light is down-regulating factors both for succinate dehydrogenase mRNA content and catalytic activity



1. 2. 3. 4.

Nothern-blot was conducted with PCR fragment of A-subunit of SDH from spinach leaves

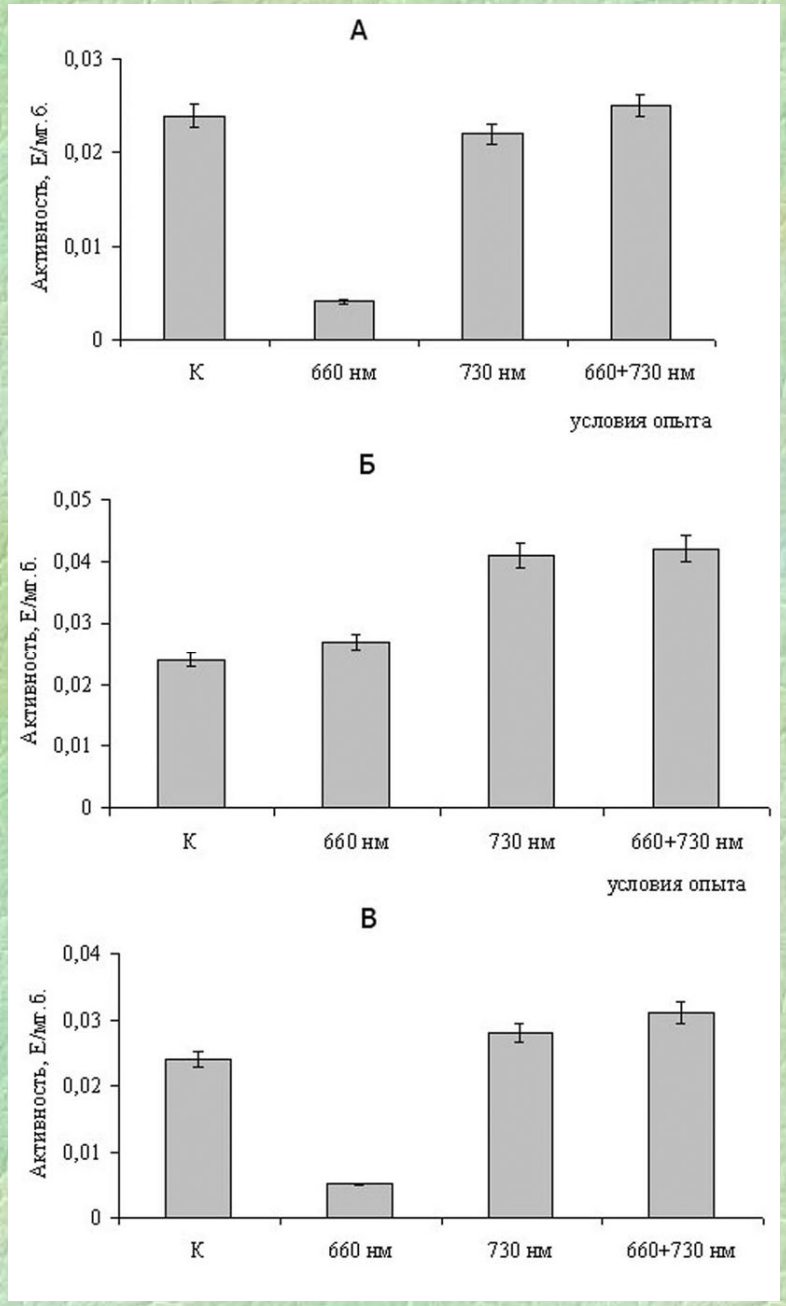
- 1 - Control plants
- 2 - 36 hours of incubation in darkness after 10 min illumination by red light (660 nm)
- 3 - 12 hours of incubation in darkness after 10 min illumination by red light (660 nm)
- 4 - 36 hours of incubation in darkness after 10 min illumination by far red light (730 nm)

It was also observed that light does not effect directly on the activity of isolated protein.

	Volume, ml	Protein, mg	Activity, U	Specific activity, U/mg protein	Yeald, %	Fold of purifica-tion
Homogenate	8,3	47,948	3,187	0,022	100	1,0
Mitochondrial fraction	1	3,853	0,512	0,133	16,1	6,0
Ammonium sulfate precipitation and gel filtration	2,2	1,392	0,774	0,556	24,3	25,3
Chromatography on DEAE-Toyapearl	2	0,4025	0,896	2,226	28,1	101,2

It is proposed that phytochrome system could participate in the regulation of succinate oxidation and, generally, of mitochondrial dark respiration by light.

- The presence of Pfr correlates with a large number of physiological responses and also regulates gene expression. Because many of these responses are reversed by FR light (which converts Pfr to Pr), Pfr is thought to be the active form for many phytochrome-mediated responses
- In the present study we have shown a participation of red light in regulation of one of the key respiratory enzyme – succinate dehydrogenase. We could exclude the possibility of light interaction with a flavin or another chromophore group bound to SUR because light had not effect on the activity of the isolated protein complex. Reduction of SUR activity and of the content of mRNA encoding one of its subunits, correspond to red light absorption by the Pr form of phytochrome.



Study of light influence on phytochrome A and B mutants shown that SDH activity is sensetive to red light and this signal is provided through phytochrome A

BUT…

I agree that as today we are participants of The International Symposium “EU Russia: Prospects for Cooperation in Biotechnology in the Seventh Framework Programme”
and it is more reasonable to talk about

- Networking as an instrument to benefit new generation of Russian biotechnologists

My personal experience was absolutely related to cooperation to:

- Russian colleagues and RFBR
- European universities and foundations
- US governmental foundation

- Finally I have some experience in communications, research technique and study planning

Last decade was hard for young scientists…

- Hard time – a lot of possibilities:
- INTAS: YS-programs
- Erasmus programs
- FEBS, NATO, EMBO fellowships
- Personal communications

We really understand preferences of personal communications

- Conferences
- Journals and e-mail communications
- Molbiol.ru web forum
- AND FINALLY RUSSIAL YOUNG SCIENTISTS NETWORK –
- Russian Union of Young Scientists – established 21.10.2005 (www.rosmu.ru)

Российский союз молодых ученых - Microsoft Internet Explorer

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РОССИЙСКОЕ СОДРУЖЕСТВО МОЛОДЫХ УЧЕНЫХ

Поиск: Ok

Сделать стартовой | Добавить в избранное

РОССИЙСКИЙ СОЮЗ МОЛОДЫХ УЧЕНЫХ

общероссийская общественная организация

- Главная
- О союзе
- Деятельность
- Регионы
- Контакты

Партнеры

НОВАЯ ПОЛИТИКА

Опросы

Как Вы считаете, кто должен **продвигать и защищать интересы науки и ученых** в России:

- сами ученые
- научные

Российский союз молодых ученых устанавливает отношения с объединением российских предпринимателей

Председатель Совета муфтиев России поддержал предложение о проведении I-го Форума молодых ученых Северного Кавказа

Президент Российского союза молодых ученых зачислен в "золотой фонд" Воронежской области

О Союзе

Российский союз молодых ученых (РоСМУ) – общероссийская общественная организация, созданная для представительства интересов молодых ученых России.

Российский союз молодых ученых видит свое предназначение в консолидации усилий молодых ученых нашей страны, направленных на совершенствование социально-общественного устройства России, разработку научно-обоснованных программ системных преобразований

Анонсы

События

01.06.2006

Российский союз молодых ученых устанавливает отношения с объединением российских предпринимателей

Состоялась встреча делегации Российского союза молодых ученых с руководителями Общероссийской общественной организации "Деловая Россия"

31.05.2006

Посещение резиденции Совета муфтиев России

Председатель Совета муфтиев России Муфтий Шейх Равиль Гайнутдин поддержал предложение Российского союза молодых ученых о проведении I-го Форума молодых ученых Северного Кавказа

27.04.2006

Российский союз молодых ученых выступает за создание центров поддержки

Internet

start EU-Russia Symp... @MAIL.RU: поч... Газета.Ru - Пу... Российский со... АФИША@MAIL.... http://www.fp6... SPB_biotech popov_rabota_... 12:52 AM

Today government gives real chances to find a collaboration with academic centers

- Provincial education is a base for development of academic science: problems of “Integration” program
- Now is new training programs of Ministry of Education (ITEB and IBC RAS, MSU, Center of Bioengerinng…)

What we really need is excellence centers distributed on Russian territory

- I represent Black-soil region and I really feel society interest to gene transfer and GM plant cultivation
- I would like to present here the idea of local research-information centers on Plant biotech and GM food

FP7 is a way to improve relation with EU research groups…

- Bologna process – educational possibilities – Socratus program
- Students and young scientist mobility…
- Unfortunately, there is no INTAS programs
- But networks is a real way to reach EU and RF funding

Russia – EU: one continent – one fate

- We need to coordinate our research (there are a lot of possibilities)
- We need to coordinate our food standards and certification procedure
- We need to coordinate “the language” of our communications