About OMICS Group

OMICS Group is an amalgamation of Open Access publications and worldwide international science conferences and events. Established in the year 2007 with the sole aim of making the information on Sciences and technology 'Open Access', OMICS Group publishes 500 online open access scholarly journals in all aspects of Science, Engineering, Management and Technology journals. OMICS Group has been instrumental in taking the knowledge on Science & technology to the doorsteps of ordinary men and women. Research Scholars, Students, Libraries, Educational Institutions, Research centers and the industry are main stakeholders that benefitted greatly from this knowledge dissemination. OMICS Group also organizes 500 International conferences annually across the globe, where knowledge transfer takes place through debates, round table discussions, poster presentations, workshops, symposia and exhibitions.

About OMICS International Conferences

OMICS International is a pioneer and leading science event organizer, which publishes around 500 open access journals and conducts over 500 Medical, Clinical, Engineering, Life Sciences, Pharma scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.

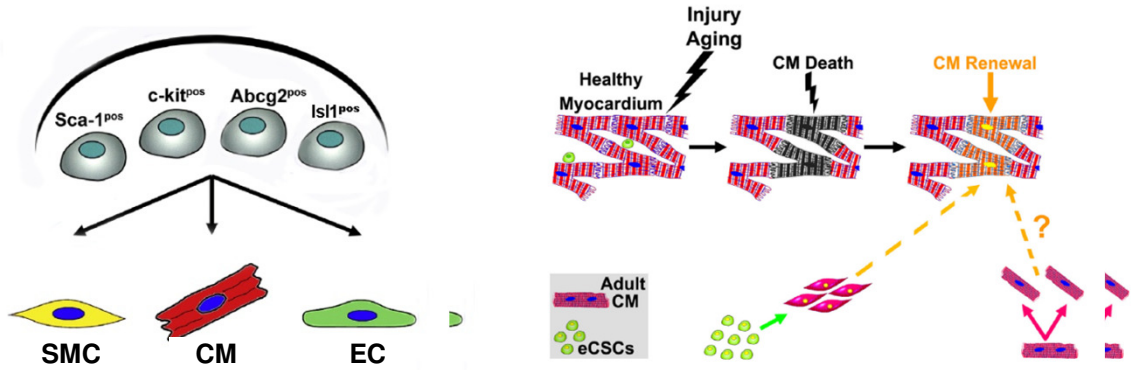
Intracellular development of cardiac stem cells as a strategic avenue to secure self-renewal, regeneration and maintenance of the mammalian myocardium

Galina Belostotskaya

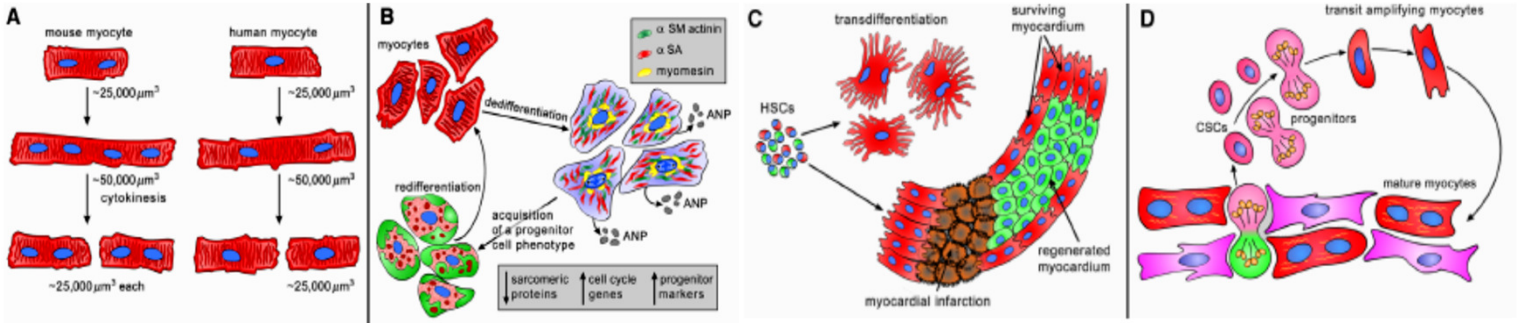
Sechenov Institute of Evolutionary Physiology and Biochemistry of the Russian Academy of Sciences, St. Petersburg, Russian Federation

Modern conceptions of self-renewal and regeneration of mammalian myocardium

A



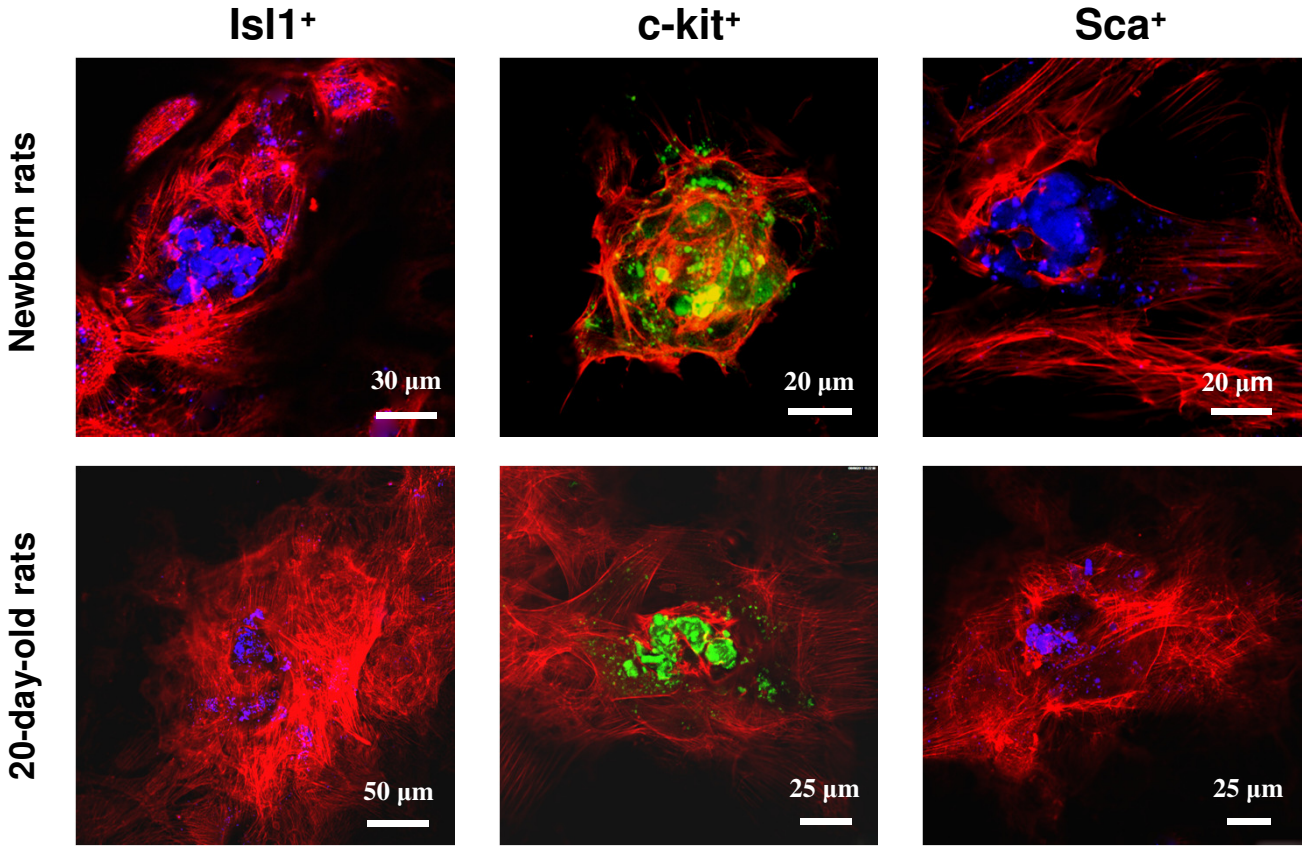
B



(A) Nadal-Ginard, et al. The cardiac stem cell compartment is indispensable for myocardial cell homeostasis, repair and regeneration in the adult. Stem Cell Res. 2014;13(3 Pt B):615-30.

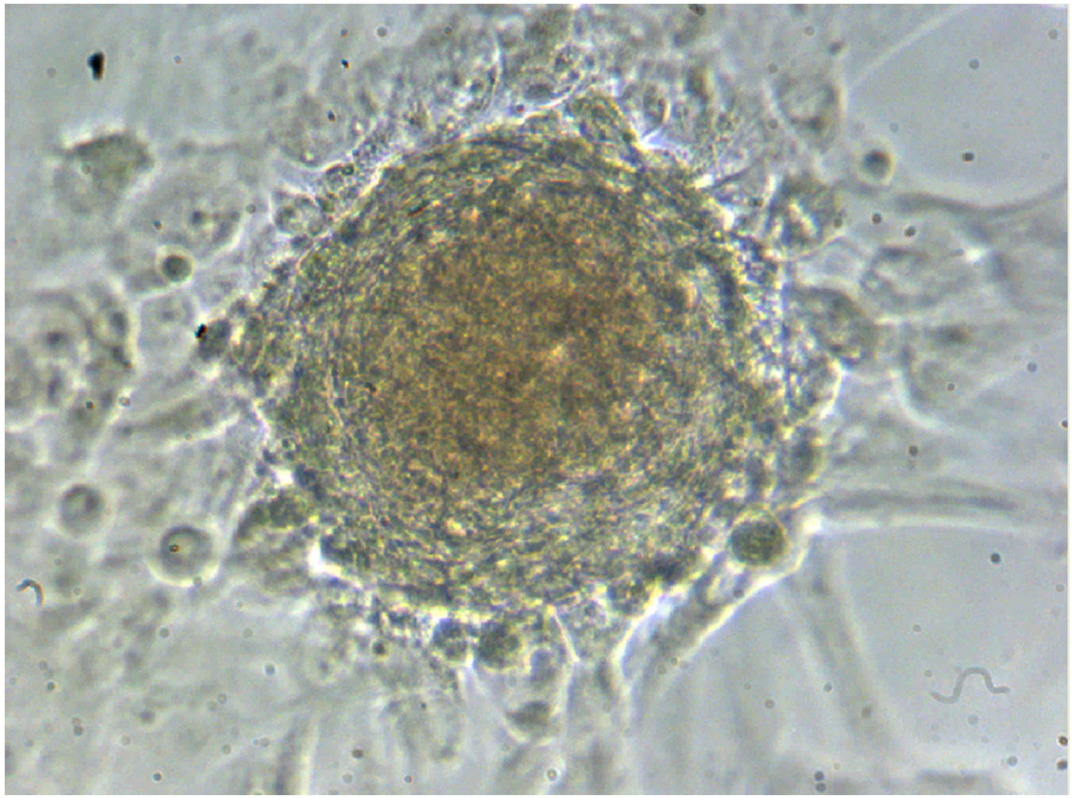
(B) Leri, et al. Origin of cardiomyocytes in the adult heart. Circ Res. 2015; 116:150-66

Immunocytochemical identification of resident cardiac stem cells (CSCs) inside the cardiac colonies, DIV 11



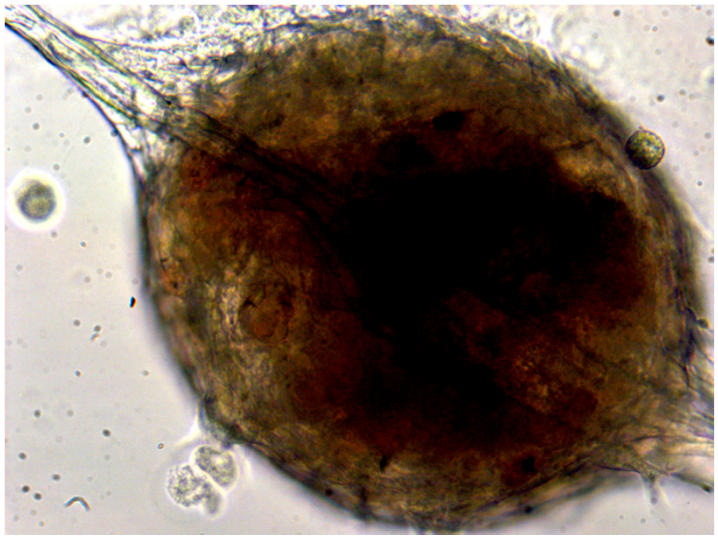
Isl1+ и Sca+ (Alexa 405, blue), c-kit+ (FITC, green), actin (Rhodamine-Phalloidin, red)

Contracting cardiomyocyte colony in the culture of newborn rat cardiac cells

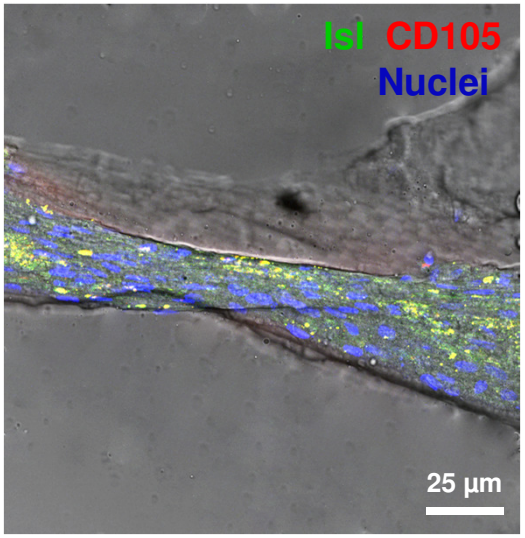


Contraction rate: 10 beats/min, DIV 11

The colony of endothelial cells formed by Isl^{+} CSCs in the culture of cardiac cells of 40-day-old rat, DIV 42

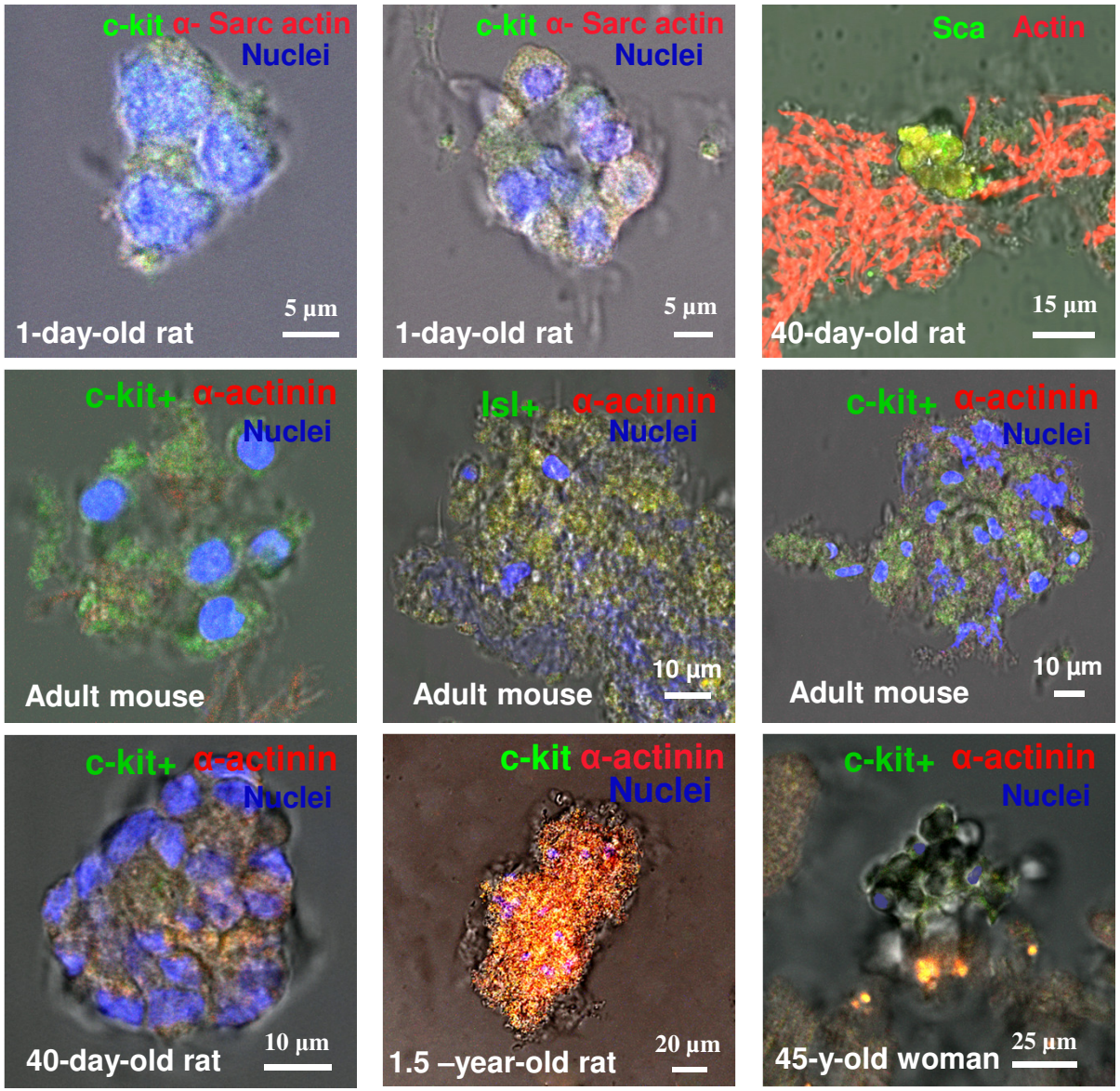


Light microscopy

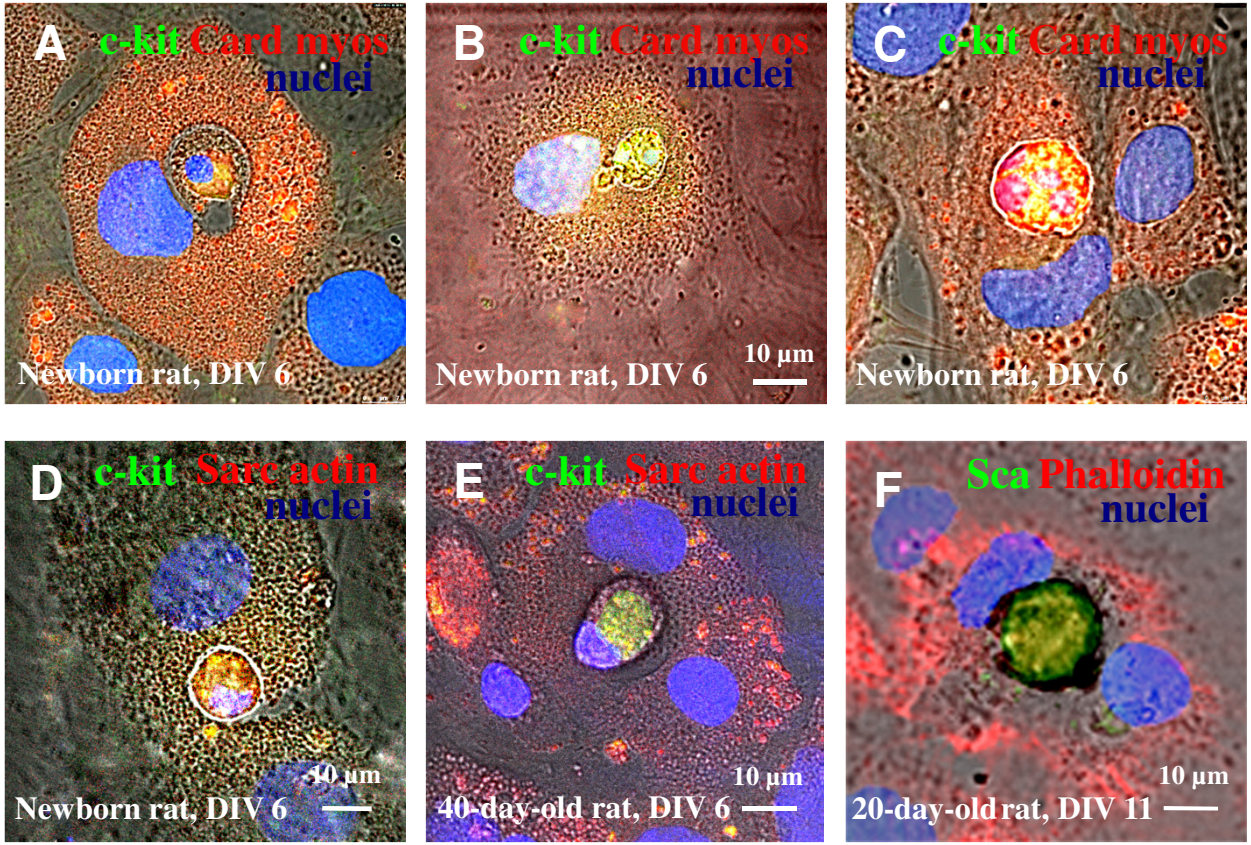


Confocal microscopy

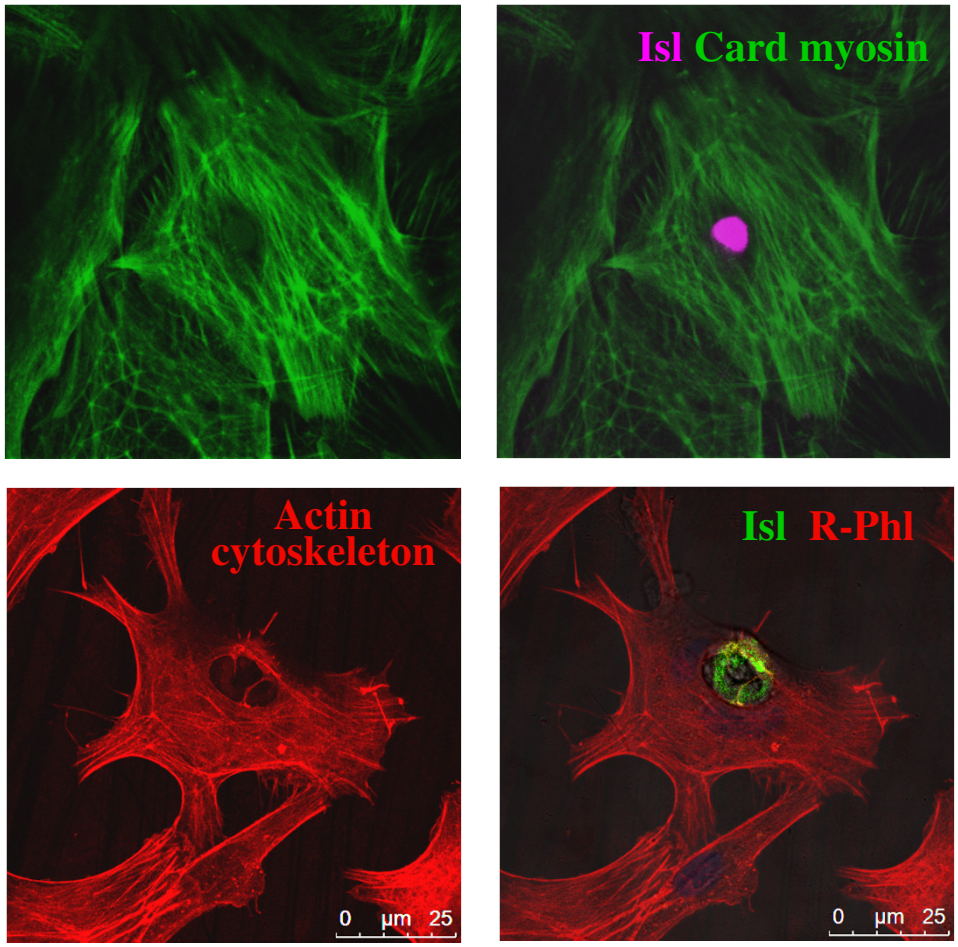
CSC-clones detected in the cardiac cells suspension (ex vivo) of mammals of different ages



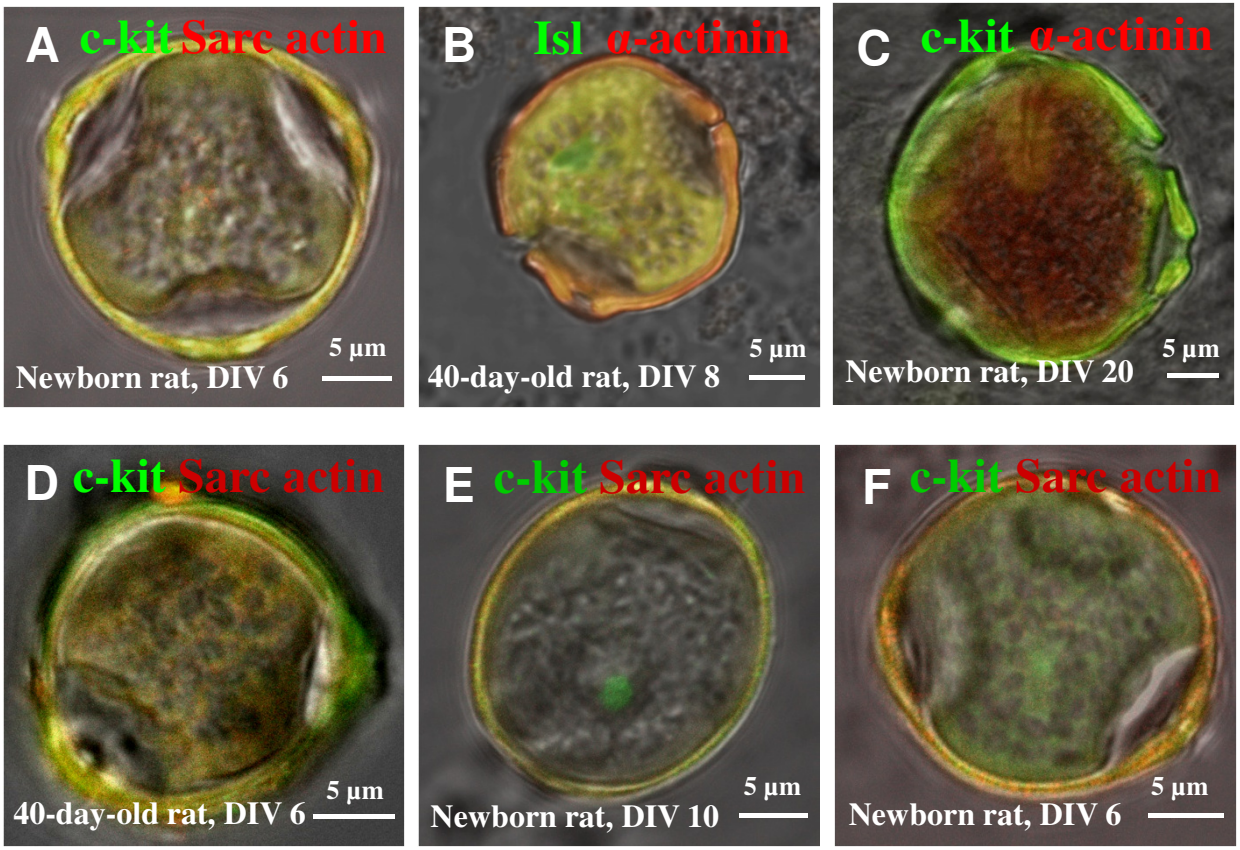
The initial stages of resident CSCs development inside mature cardiomyocytes of different ages rats in primary culture with formation cell-in-cell structure (CICSs)



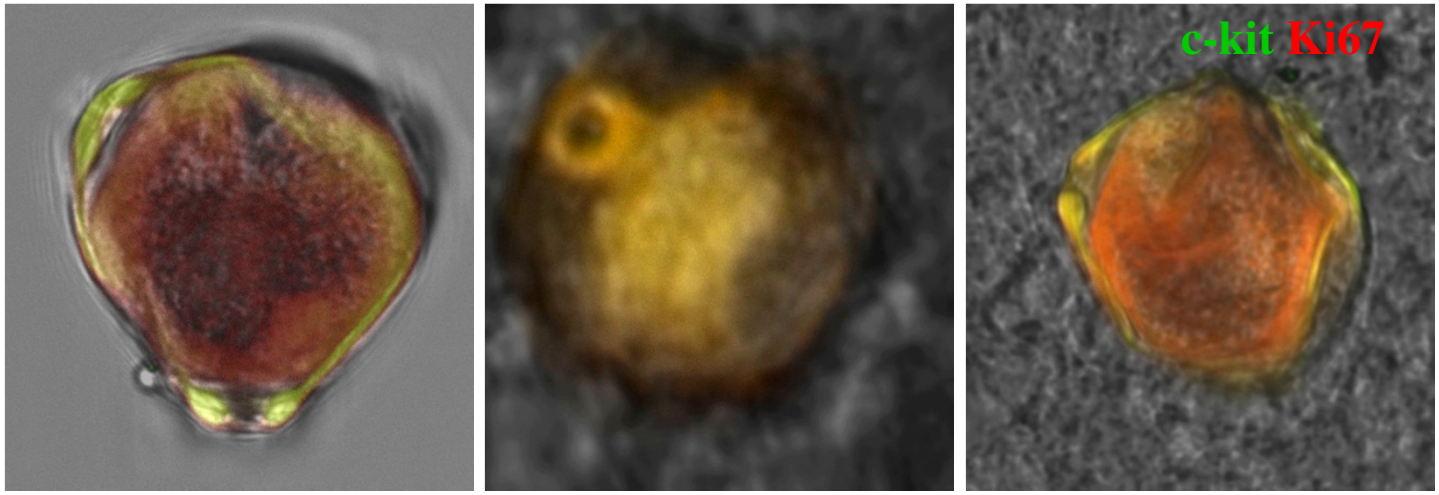
Proofs for intracellular CSCs location inside of cardiomyocytes



CSC-CICSs of different ages rats in culture



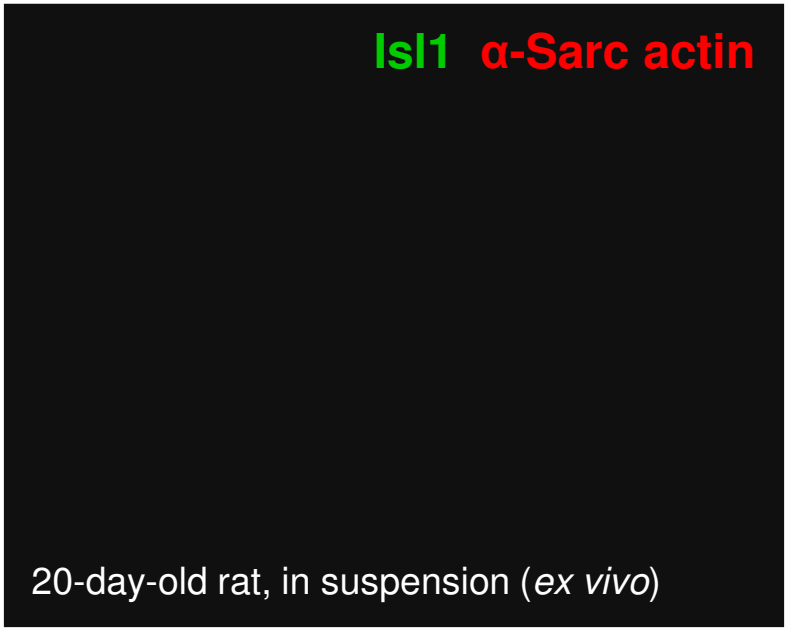
Proofs for CSCs proliferation (Ki67^{pos}) inside cardiomyocytes in ex vivo experiments.



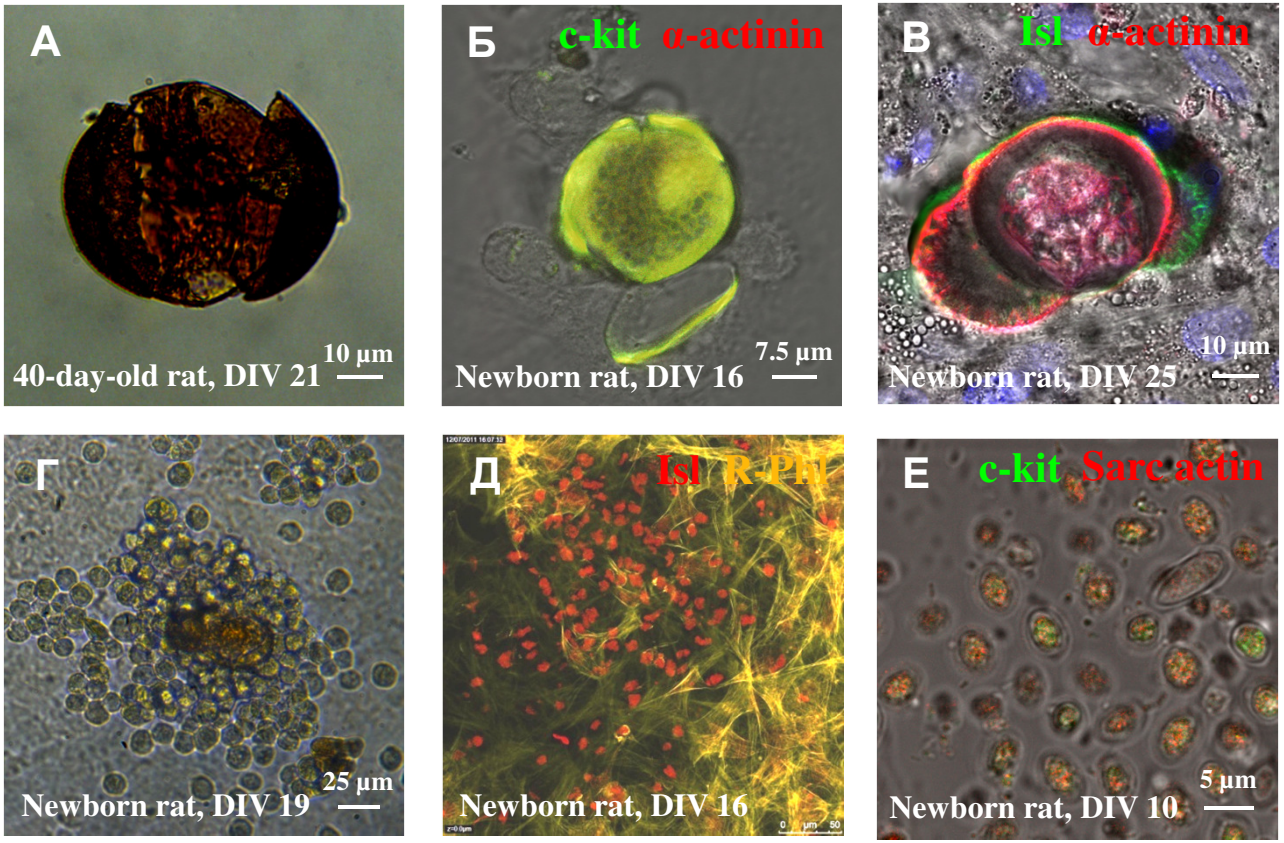
c-kit^{+}-CICSs in the suspension of freshly isolated cardiac cells of 40-day-old rats.

Optical tomography of cell-in-cell structures (CICSs) in in vitro and ex vivo experiments

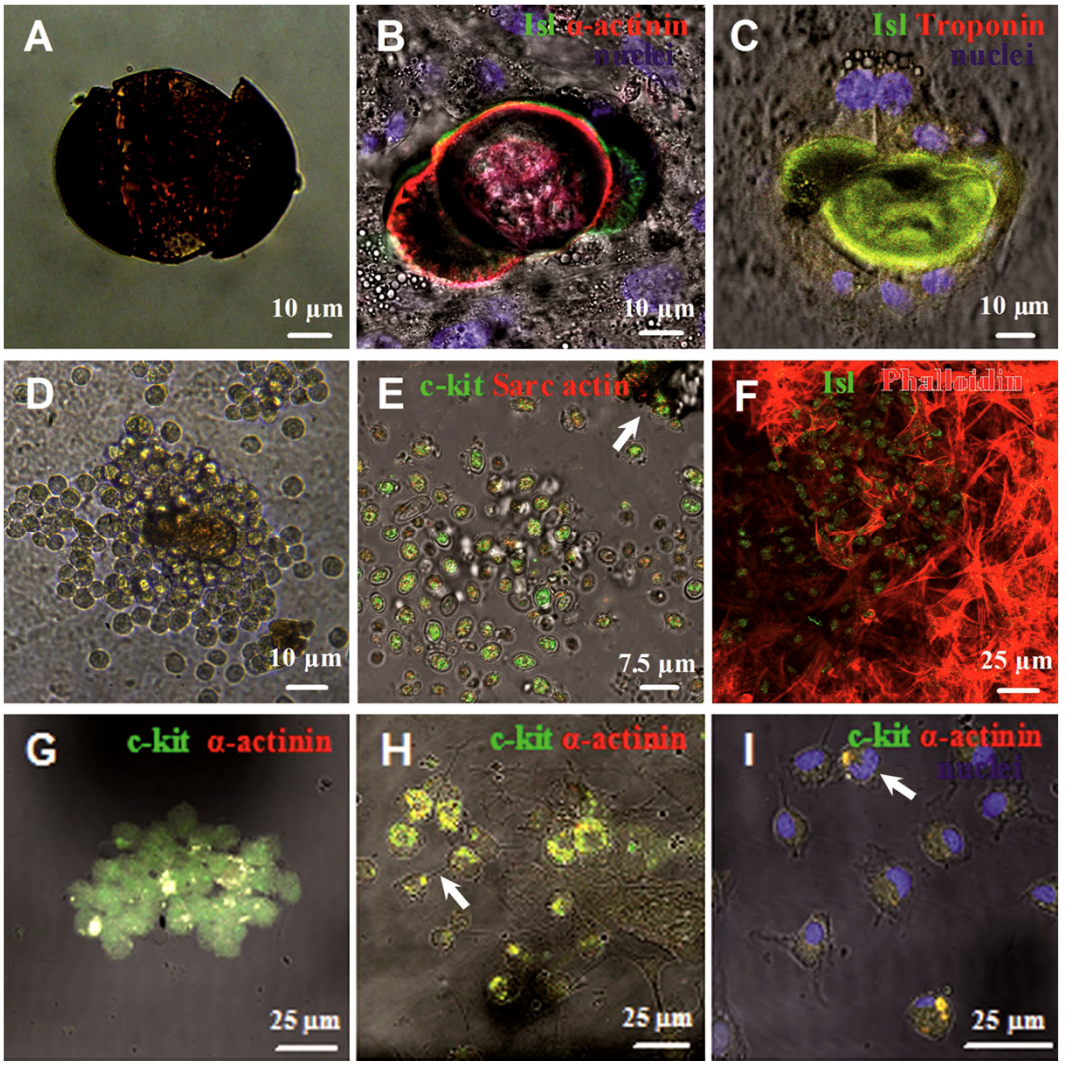




The rupture of CICS capsule and the release of transient amplifying cells from the CICS

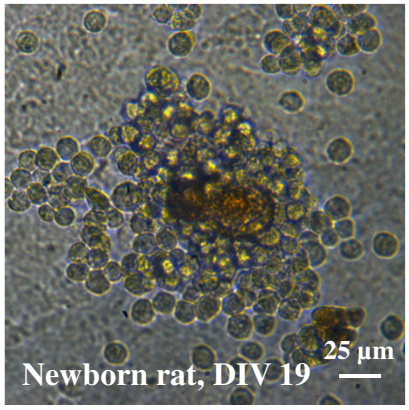


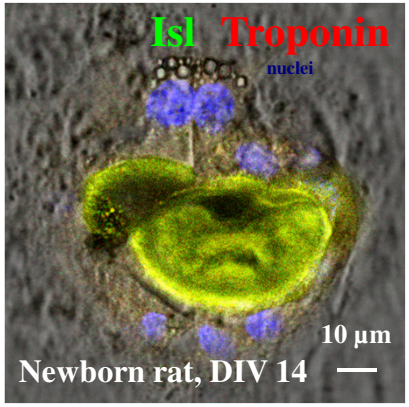
The rupture of CICS capsule and the release of transient amplifying cells from the CICSs



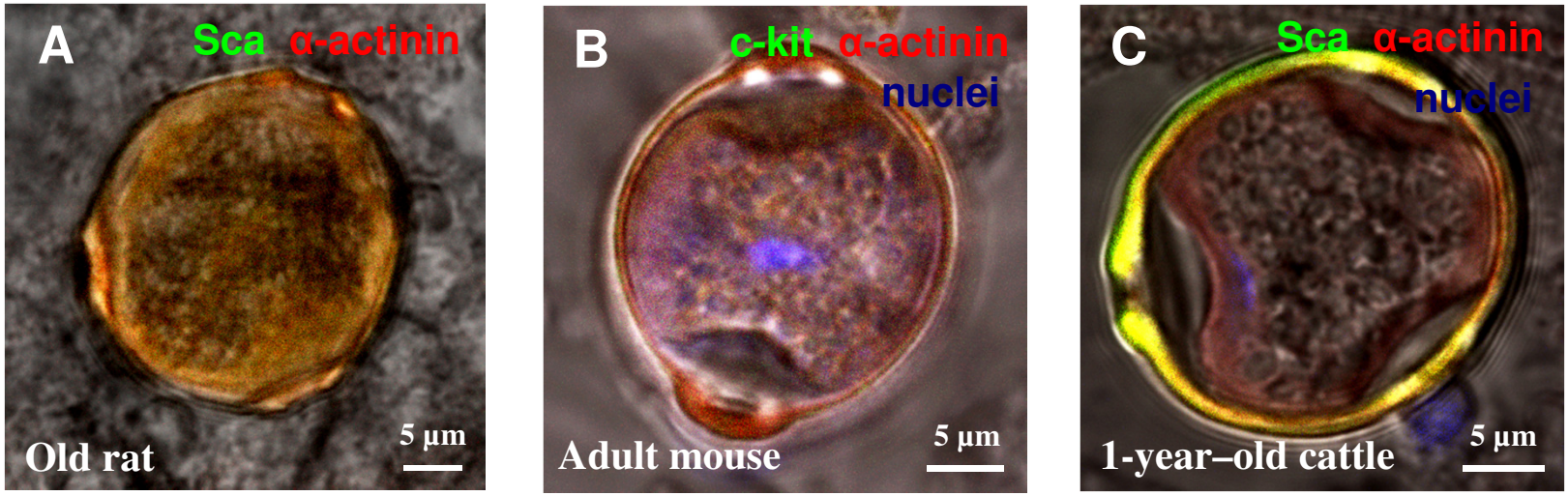
The rupture of CICS capsule in culture



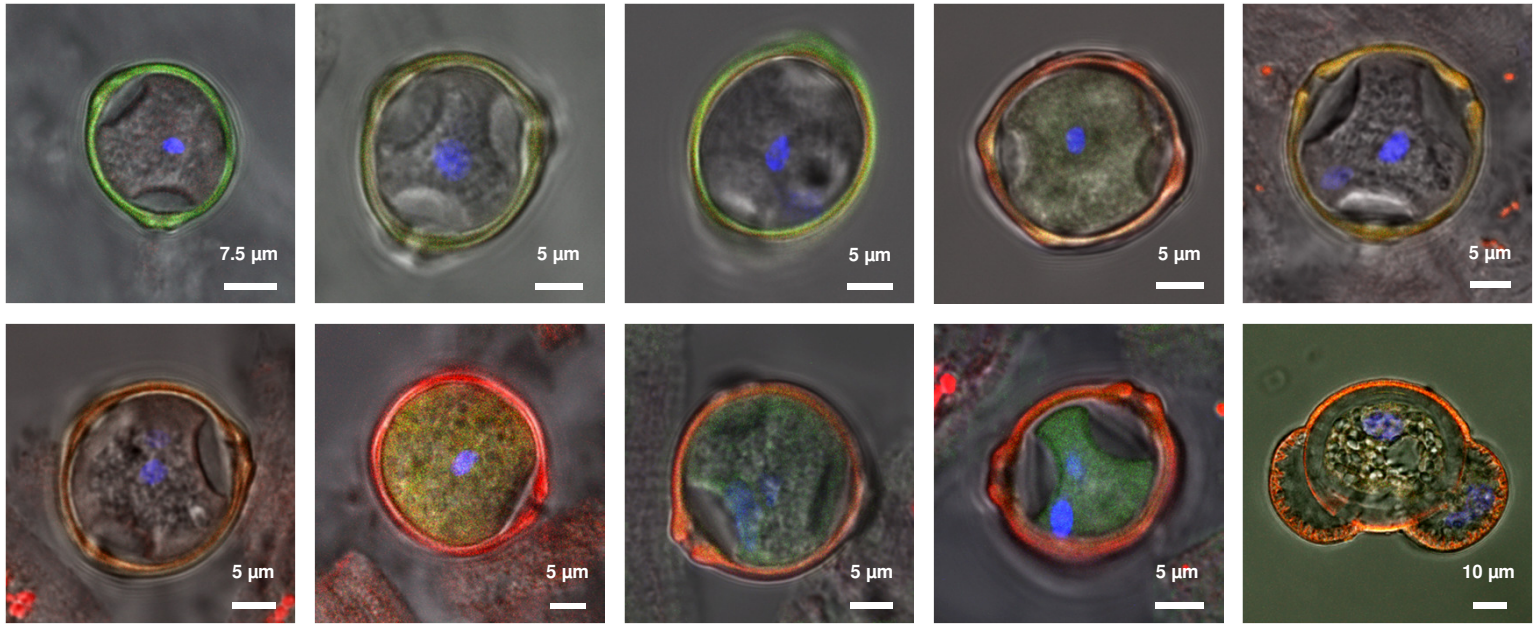




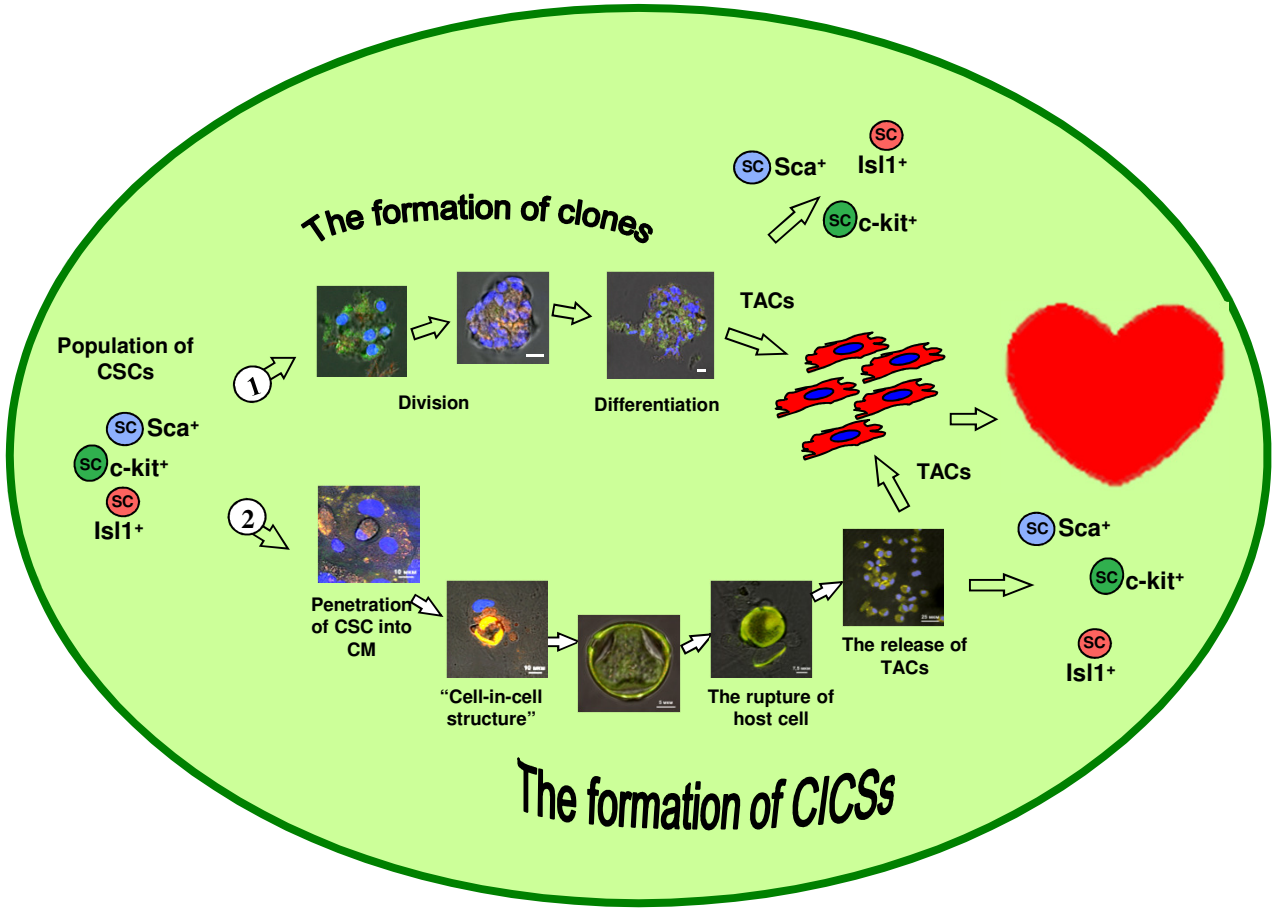
CICSs detected in the suspension of mammals cardiac cells (ex vivo)



CICSs detected in the suspension of human cardiac cells (ex vivo)



Hypothetical mechanism of mammalian myocardium self-renewal



Выводы

1. Формирование зрелых кардиомиоцитов в миокарде млекопитающих происходит 2 путями: путем клонообразования и посредством внутриклеточного развития резидентных КСК внутри зрелых клеток миокарда приблизительно с одинаковой частотой 1 клон и 1 CICS per 100000 cardiac cells.
2. Клонообразование является самым быстрым и продуктивным способом воспроизводства зрелых клеток, давая популяцию сокращающихся кардиомиоцитов уже через 10-13 дней.
3. Внутриклеточное развитие КСК также дает значительное количество транзиторных клеток (около 200) из одного кардиопредшественника, но требует большего времени: до 25-40 дней.
4. Нарушение метаболизма сердечной мышцы сдвигает равновесие в ту или другую сторону.
5. При ишемии и инфаркте, сопровождающихся ацидозом и гипоксией, дифференцировка клеток в составе колоний подавляется, в то время как количество CICSs возрастает в 10-15 раз. Мы предполагаем, что переход на внутриклеточное развитие объясняет бездействие КСК при острой патологии.
6. В противоположность этому снижение нагрузки на сердечную мышцу во время невесомости способствует клонообразованию КСК, не влияя на количество CICSs.

Спасибо за внимание!

Thanks' for your kind attention!!!!!!



Let Us Meet Again

We welcome you all to our future conferences of OMICS International

Please Visit:

http://cardiology.conferenceseries.com

http://www.conferenceseries.com/

http://www.conferenceseries.com/clinical-research-conferences.php