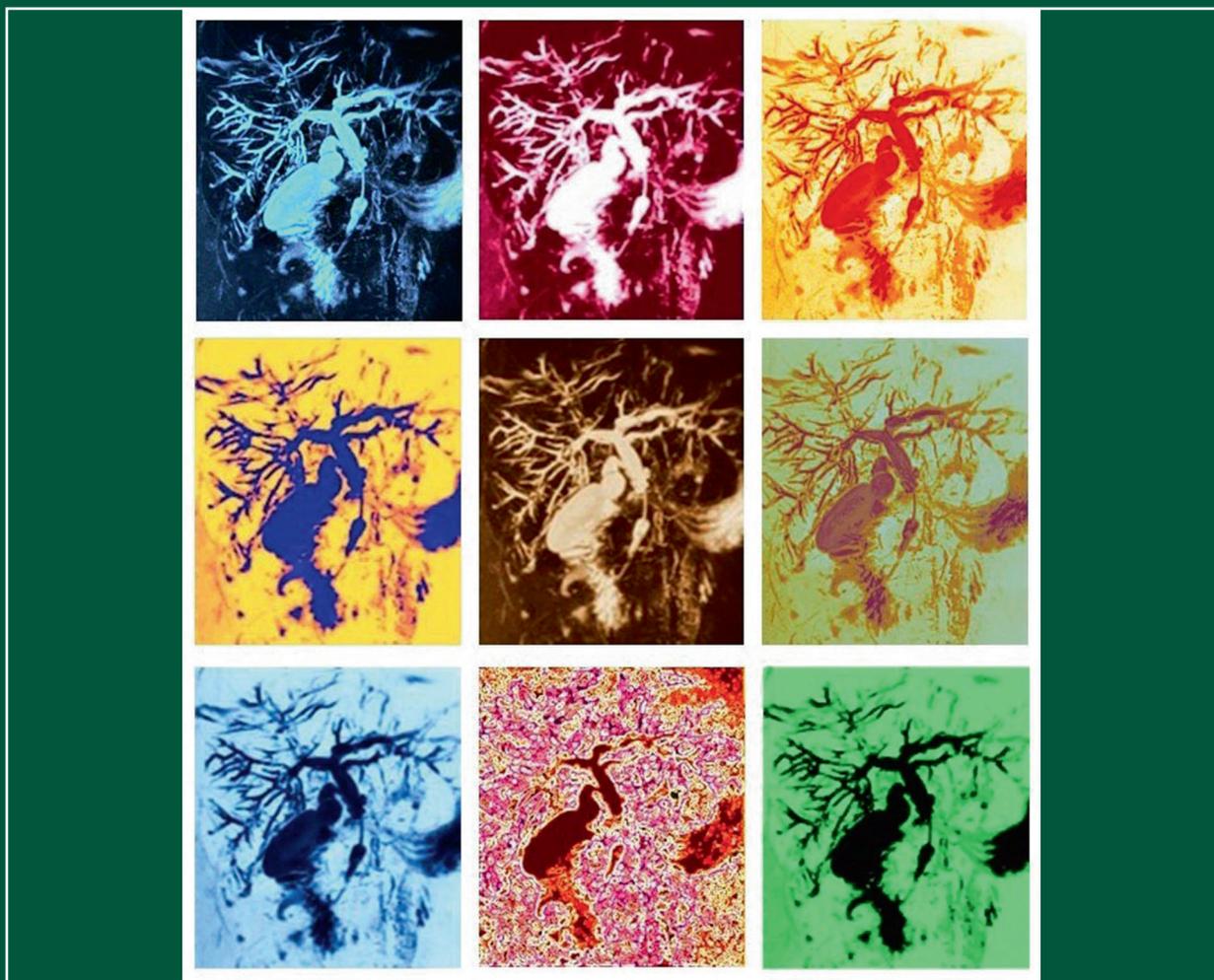


# European Journal of Clinical Investigation

56TH ANNUAL SCIENTIFIC MEETING –  
8–10 June 2022, Bari, Italy



## Cholangiocarcinoma - 9 faces of the killer

It shows cholangiocarcinoma, an aggressive bile duct tumour with dismal prognosis,  
It was captured during magnetic resonance cholangiopancreatography (MRCP)

Piotr Milkiewicz, Warsaw Poland

# European Journal of Clinical Investigation

THE JOURNAL OF THE EUROPEAN SOCIETY FOR CLINICAL INVESTIGATION

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## Aims & Scope

The European Journal of Clinical Investigation (EJCI), in publication since 1970, is a peer-reviewed general-interest biomedical journal with a broad readership. It is the official journal of the European Society for Clinical Investigation (ESCI) and it is published monthly by Wiley. It considers any original contribution from the most sophisticated basic molecular sciences to applied clinical and translational research and evidence-based medicine across a broad range of subspecialties. The EJCI publishes reports of high-quality research that pertain to the genetic, molecular, cellular, or physiological basis of human biology and disease, as well as research that addresses prevalence, diagnosis, course, treatment, and prevention of disease. We are primarily interested in studies directly pertinent to humans, but submission of robust *in vitro* and animal work is also encouraged. Interdisciplinary work and research using innovative methods and combinations of laboratory, clinical, and epidemiological methodologies and techniques is of great interest to the journal. Several categories of manuscripts (for detailed description see below) are considered: editorials, original articles (also including randomized clinical trials, systematic reviews and meta-analyses), reviews (narrative reviews), opinion articles (including debates, perspectives and commentaries); and letters to the Editor.

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cases. Decrease in myocardial contractility compared to the initial values was not observed during the entire reperfusion period (LVDP<sub>initial</sub> = 52±5.2 mmHg and LVDP<sub>reperfusion</sub> = 58±5.8 mmHg), what allows us to conclude about the effectiveness of myocardial protection by the new CPS.

**Conclusions:** In our experiment on a model of an isolated rat heart, which is widely used for the study of various CPR, we showed that the new solution is able to quickly and effectively cause myocardial plegia, and also does not interfere with the rapid and full recovery of its function after the start of reperfusion. This paper has been supported by the Kazan Federal University Strategic Academic Leadership Program (PRIORITY-2030)

### 56ASM-0099 | The effect of $\alpha_2$ -adrenoreceptors on the isolated rats heart contractility with a model of myocardial infarction in the acute stage

L. Khisamieva; A. Kuptsova; R. Bugrov; N. Ziyatdinova; T. Zefirov  
Kazan Federal University, Department of Human Health Protection, Kazan, Russia C.I.S.

**Background:** Stimulation of  $\alpha_2$ -adrenergic receptors ( $\alpha_2$ -AR) has a direct cardioprotective effect. The researchers revealed an increase in the expression of  $\alpha_2$ -AR subtypes in rats with spontaneous hypertension, as well as the dysfunction of  $\alpha_2$ -AR and the inefficiency of signaling pathways associated with  $\alpha_2$ -AR. The aim of this study was to investigate the effect of  $\alpha_2$ -AR stimulation of the isolated heart contractility with a myocardial infarction (MI) model 24 hours after the influence.

**Materials and Methods:** Ex vivo experiments were performed on isolated hearts of intact rats ( $n = 7$ ) and rats with a model of MI ( $n = 10$ ) 24 hours after the operation. IM is reproduced by ligation of the anterior branch of the left coronary artery. Agonist  $\alpha_2$ -AR clonidine hydrochloride was used in concentration of  $10^{-9}$  Mol. The data were statistically processed using Student's t-test.

**Results:** A comparative analysis of  $\alpha_2$ -AR stimulation revealed that in intact rats, the agonist reduced contractility by 21% ( $p < 0.05$ ), and with the MI model, 24 hours after modeling, it increased by 38% ( $p < 0.01$ ).

**Conclusions:** Thus, in our experiments  $\alpha_2$ -AR stimulation revealed multidirectional effects on inotropy reaction of intact rats isolated heart and rats with the MI model. The study was supported by Russian Science Foundation (grant No. 21-15-00121, <https://rscf.ru/project/21-15-00121/>)

### 56ASM-0100 | If-currents are involved in heart contractility regulation of rats with acute myocardial infarction model

L. Khisamieva; R. Bugrov; A. Kuptsova; N. Ziyatdinova; T. Zefirov  
Kazan Federal University, Department of Human Health Protection, Kazan, Russia C.I.S.

**Background:** Many factors have been identified in the development of coronary heart disease, such as hypertension, diabetes, smoking and an increase in heart rate. "Funny currents" (If-currents) play a key role in the electrogenesis of cardiomyocytes. The density of If currents increase in atrial and ventricular myocytes in patients with heart failure. The aim of this study was to investigate the effect of the blockade If-currents on the contractility of isolated heart with a model of myocardial infarction (MI) 24 hours after experimental influence.

**Materials and Methods:** Ex vivo experiments were performed on Langendorff-isolated hearts of intact ( $n = 7$ ), sham-operated ( $n = 6$ ) rats and with a model of MI ( $n = 10$ ) 24 hours after experimental influence. IM is reproduced by ligation of the anterior branch of the left coronary artery. To block If currents, ZD7288 was used at a concentration of  $10^{-9}$  Mol. The data were statistically processed using Student's t-test.

**Results:** Blockade of If-current revealed that in intact rats group ZD7288 increased contractility by 47% ( $p < 0.05$ ), in sham-operated animals – by 23% ( $p < 0.01$ ), in the MI model 24 hours after the simulation increased by 20% ( $p < 0.01$ ).

**Conclusions:** Thus, our study showed that in the group of rats with a model of acute myocardial infarction, the effect of If on the contractility of the isolated heart decreases. The study was supported by Russian Science Foundation (grant No. 21-15-00121, <https://rscf.ru/project/21-15-00121/>)

### 56ASM-0101 | Analysis of rats myocardial contraction force at different stages of experimental infarction

L. Khisamieva; R. Bugrov; A. Kuptsova; N. Ziyatdinova; T. Zefirov  
Kazan Federal University, Department of Human Health Protection, Kazan, Russia C.I.S.

**Background:** The study of experimental models of myocardial infarction (MI) is necessary for the development of innovative methods of treatment of this disease. The aim of this study is to conduct a comparative analysis of the

effect of myocardial infarction on the contractility of the isolated rat heart at different stages of MI.

**Materials and Methods:** The experiments were performed ex vivo on isolated hearts of intact and rats with a model of MI after 1 day, 54 days and 120 days after the simulation. MI was performed according to the classical technique - ligation of the anterior branch of the left coronary artery. The contractile activity was studied on the Langendorff System. The data were statistically processed using Student's t-test.

**Results:** A comparative analysis of the effect of MI on the initial values of contraction force in the studied groups revealed that in rats the contraction force decreased one day after MI and tended to increase 54 and 120 days after the simulation of MI.

**Conclusions:** Thus, it was shown that at different stages of the postinfarction period, multidirectional changes of the isolated rat heart myocardium contractions force are observed. The study was supported by Russian Science Foundation (grant No. 21-15-00121, <https://rscf.ru/project/21-15-00121/>)

#### 56ASM-0102 | Effect of HCN channel blocker in the regulation of chronotropic effects in rats with limited motor activity

*M. Sungatullina; R. Zaripova; R. Shakirov; N. Ziyatdinova; T. Zefirov  
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**Background:** In the modern world, limitation of motor activity is an acute problem, because there are many reasons leading to this way of life. Hypokinesia causes atrophy of the musculoskeletal system, complicates the digestive, respiratory and cardiovascular systems. The involvement of HCN channels in the mechanism of heart rhythm acceleration has been shown. It is interesting to see the effect of blockade of If-currents and their role in the regulation of chronotropy of the heart against the background of increased heart rate (HR) in response to hypokinesia.

**Materials and Methods:** The experiments were conducted on two groups of rats: 1- control group, rats 7 weeks old; 2 - experimental group, rats with restriction of motor activity for 30 days. This effect was achieved by placing 3-week-old rats in penal cages under conditions of increasing hypokinesia. The effect of If blocker ZD7288 ( $10^{-9}$ M and  $10^{-6}$ M) on chronotropic effects was studied using Langendorff PowerLab8/35 (ADInstruments, Australia).

**Results:** After the introduction into the perfused solution ZD7288 ( $10^{-9}$ M), a decrease in heart rate by 15% was observed in control rats ( $p < 0.01$ ) and by 11% ( $p < 0.05$ ) in the experimental group. The blocker If in concentrations  $10^{-6}$ M decreased heart rate in the control group by 28% ( $p < 0.01$ ) and by 17% in experimental group.

**Conclusions:** If-current blocker ZD7288 at all concentrations caused a decrease in heart rate in control rats and rats, with limitation of motor activity. However, more pronounced changes in heart rate were observed in the control group of rats and after application of the maximum concentration. It is possible that in rats with limited motor activity, against the background of an increase in heart rate, the density of HCN channels decreases compensatory, which leads to decrease their role in the regulation of heart rate. This paper has been supported by the Kazan Federal University Strategic Academic Leadership Program (PRIORITY-2030)

#### 56ASM-0103 | Isolated rat heart after restriction of motor activity and recovery

*M. Sungatullina; R. Zaripova; L. Mosolov; N. Ziyatdinova; T. Zefirov  
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**Background:** Restriction of motor activity becomes a medical and social problem. Restriction of muscle activity leads to violations of all organ systems of the human body. Namely, in the cardiovascular system, prolonged restriction of motor activity leads to coronary vessels, the heart muscle weakening, decreasing of the heart energy potential and minute volume. The aim of our study was to study possible age-related changes in the parameters of the isolated rat heart after hypokinesia and subsequent recovery.

**Materials and Methods:** Restriction of motor activity was carried out by placing animals in pencil cases in conditions of increasing hypokinesia for 30 days. The recovery stage after hypokinesia for 14 days was carried out in order to study the mechanisms of adaptation of the animal to changes in the motor regime. The following parameters of the isolated heart were recorded - the pressure developed in the left ventricle (LVL), heart rate (HR) and coronary flow (CP) on the Langendorff PowerLab 8/35 unit (ADInstruments, Australia). Statistical processing was carried out in Excel, the reliability was determined using the Student's t-test.

**Results:** After hypokinesia, unidirectional changes in the parameters of the isolated heart were observed in 7-week-old and adult rats: a decrease in the parameters of the LVL, CP and an increase in heart rate. However,