

ного йодом-124 (^{124}I -С6.5db) для диагностики рака молочной железы методами позитронно-эмиссионной томографии (ПЭТ). Ввиду высокой специфичности данного антитела к рецептору HER2, накопление препарата происходит только в злокачественных опухолях, что позволяет провести количественный анализ *in vivo* с помощью ПЭТ технологии и одновременно получить четкое изображение пространственной локализации опухоли. Также ведутся работы по изучению меченных йодом-125 антител, взятых из препаратов Герцептин (Транстузумаб) и anti-HER2 C6.5 димерных антител для получения точных количественных характеристик HER2 *in vitro*.

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MECHANODEPENDENCE OF CALCIUM ACTIVATION OF MYOCARDIUM CONTRACTIONS: CONCEPTUAL DISAGREEMENTS AND THEIR RESOLVING IN A MATHEMATICAL MODEL

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There are several processes, which allow the contracting heart muscle accommodate to mechanical conditions, in which contraction is occurred. Among them it is need to mark intracellular mechanisms of two types:

- (1) ion currents through mechanosensible channels of cell membrane
- (2) mechanisms, which implement contribution of mechanical factors to calcium regulation of thin sarcomere threads.

The theme of researching of this project is mechanisms of the second type. Mechano-Calcium feedbacks – are important part of electro-mechanical conjunction of myocardium. Particularly, this is one of principal elements of its contractile activity autoregulation in normal and pathological conditions. These bindings underlie precise adjustment of electrical and calcic activation of heart muscle to mechanical conditions of contraction. There is wide spectrum of experimental and theoretical works, which indicate that the key element, realizing this binds in «contraction-relation» cycles of intact cardiomyocytus, is mechanism of affinity of troponin to calcium from attached myosin transverse bridges number. In same time multiple experiments on skinned myocardium specimens (trabeculas and papillary muscles), show that mechanical conditions (length of stretched specimen) have a substantial impact to calci-

um sensibility in stationary «pCA-power» correlation, but practically not affect to Hills cooperativeness coefficient of this relationship.

This experimental data had forced many authoritative researchers to doubt the conception of mechanisms of cooperativeness participated in realization of mecano-relation of calcium activation of heart muscle.

For solving this collision the hypothesis, which define more precisely view to mechanisms of cooperativeness calcium-throponin complexes and transverse bridges, had been proposed. This hypothesis allows one to interpret whole variety of calcic and electric activation in «contraction-relaxion» cycles of intact myocardium mecha-no-relations data, and peculiarities of stationary «pCa-power» correlation in skinned fiber.

Equations that formalize this hypothesis are incorporated to previously developed «Oxford-Ekaterinburg» model. Qualitative analysis of novel model equations and numerical experiments on it to make theoretical proof of those assumptions is currently performed.

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МАГНИТОТЕРАПЕВТИЧЕСКАЯ УСТАНОВКА

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MAGNETOTHERAPY DEVICE

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The article describes a new way of forming bipolar current impulses with short fronts and falls in the magnetotherapy device. The method is able to expand the capabilities of the device. The method was realized by including the additional board that consists of a transistor bridge circuit and a driver control board.

Работа над созданием блока управления для магнитотерапевтической установки ведётся на кафедре экспериментальной физики в течение двух последних