SEPARATION OF TWO HEADS IN RABBIT SKELETAL MYOSIN

Atsushi SAKAI

Department of Biochemistry
Faculty of Veterinary Medicine
Hokkaido University, Sapporo 060, Japan

Myosin is composed of two heavy chains and two to four light chains. The light chains are localized in subfragment-1 (S-1, head of myosin) and are different in number and kinds in the different types among muscles and tissues.

Each of the S-1 contained L_1 chain (L_1-S-1 (CT)) and the S-1 contained L_3 chain (L_3-S-1 (CT)) was separated from S-1 (S-1 (CT)) prepared by chymotryptic digestion of myosin in a yield of 90 % by affinity chromatography of a column of blue dextran-Sepharose 4 B. S-1 (CT) was composed of equimolar amounts of L_1-S-1 (CT) and L_3-S-1 (CT). L_1-S-1 (CT) had following the activities; 0.68 U/mg of Ca^{2+}-ATPase, 0.01 U/mg of Mg^{2+}-ATPase and 0.4 moles of an initial burst of Pi/mole of protein. L_3-S-1 (CT) had the following activites; 1.00 U/mg of Ca^{2+}-ATPase, 0.02 U/mg of Mg^{2+}-ATPase and 0.5 moles of an initial burst of Pi/mole of protein. Actin activated Mg^{2+}-ATPase of L_1-S-1 (CT) was 1.4 times higher than that of L_3-S-1 (CT), and this may reflect a distinction in the mode of interaction of these subfragments with actin. These results suggest that rabbit skeletal myosin has tow different kinds of isozymes.

STUDIES ON THE ANTEMORTEM DETECTION OF PSE MUSCLE IN PIGS BY A HALOTHANE-TEST, PLASMA CREATINE PHOSPHOKINASE (CPK) ACTIVITIES AND BLOOD LACTATE VALUES

Hiroko SANO

Department of Veterinary Internal Medicine
Faculty of Veterinary Medicine
Hokkaido University, Sapporo 060, Japan

Halothane-test, and the determination of plasma CPK activities and blood lactate values before and after the test were carried out on 123 purebred of Landrace, Large White and Hampshire breeding at an average of 24 kg live weight. Hundred and sixteen of these pigs were slaughtered at 90 kg live weight to examine muscle quality characteristics in order to determine the PSE appearance and frequencies of PSE muscle.

No significant correlations were determined between halothane sensitivities with

muscle rigidity or erythema congestivum during halothane-test and frequencies of PSE muscle. Ascending rates of plasma CPK were correlated with L-value (brightness of color) of muscle in Landrace ($r=0.3021$, $P<0.05$) and in Large White pigs ($r=0.3014$, $P<0.05$). Blood lactate were correlated with L-value ($r=0.3906$, $P<0.01$), water holding capacity ($r=0.4489$, $P<0.01$) and extensible ratio ($r=0.3225$, $P<0.05$) of muscle in Landrace pigs. On the other hand, other results, i. e., correlations between the blood parameters and muscle characteristics were not significant. In conclusion, there were no clear relationships between antemortem parameters employed in this study and frequencies of PSE muscle or muscle characteristics. The possibility and value of antemortem detection of PSE muscle by the methods used for these parameters was discussed.

STUDIES ON MAREK'S DISEASE TUMOR-ASSOCIATED SURFACE ANTIGEN

Kazuo SUZUKI

Department of Epizootiology
Faculty of Veterinary Medicine
Hokkaido University, Sapporo 060, Japan

The purpose of the present study is to examine the serological, physical, and chemical natures of Marek's disease tumor-associated surface antigen (MATSA) on line cells derived from Marek's disease tumors. In the serological study, antisera to two Marek's disease derived line cells (MSB-1 and RPL-1) did not cross-react with the corresponding heterologous line cells, as examined by the indirect membrane immunofluorescent antibody (IFA) and the complement-dependent antibody cytotoxicity (CDAC) tests. For solubilization of the tumor antigen from MSB-1 cells, sodium deoxycholate (SoDOC) was most effective, and the method combining freeze-thawing and sonication was also effective. However, solubilization by three other kinds of non-ionic detergents (Triton X-100, Tween 80, and NP-40) resulted in failure. The activity of the soluble tumor antigen was detected by IFA-blocking and CDAC-blocking tests, and the physical and chemical natures of the antigen were characterized as follows:

1) In thermo-stability test, the soluble tumor antigen was stable when heated at 45°C for 30 minutes, but was inactivated by heating at 50°C or more for 30 minutes.

2) In pH stability test, the soluble tumor antigen was stable at pH 6.0～8.5.

3) The soluble tumor antigen was stable after treatment with ether, but unstable after treatment with $NaIO_4$ and proteolytic enzymes (pronase and trypsin). The treatment of intact MSB-1 cells with pronase resulted in the reduction of the positive proportion of MATSA by the IFA test.