

Figure 1. A, Human adipocytes visualized for nuclei (blue), lipid droplets (green), and perilipin (red). B, Lipolysis in adipocytes is regulated by perilipin (circles), hormone sensitive lipase (HSL, triangles), and other regulatory proteins (e.g., ATGL, not shown). A well known pathway, depicted here, is activation of lipolysis by β -adrenergic stimulation. Interaction of isoproterenol (Iso) with β -adrenergic receptors (BAR) leads to increased cAMP, and activation of c-AMP-dependent protein kinase (PKA). PKA phosphorylates both perilipin (filled circles) and HSL and phosphoHSL (filled triangles), leading to translocation of HSL to the lipid droplets.

PERILIPIN AND PHOSPHOPERILIPIN CONTROL OF LIPOLYSIS

Obesity is an overwhelming problem in the USA and in developing countries, worldwide(1, 2). The abundance of food and lack of exercise leads to an accumulation of triglycerides within lipid droplets in fat tissue (adipocytes). In adipocytes,

the lipid droplets are coated with a layer of proteins that regulate their growth and metabolism. The major lipid droplet-associated protein in adipocytes is perilipin(3). Mice in which the endogenous gene for perilipin is knocked out have a lean

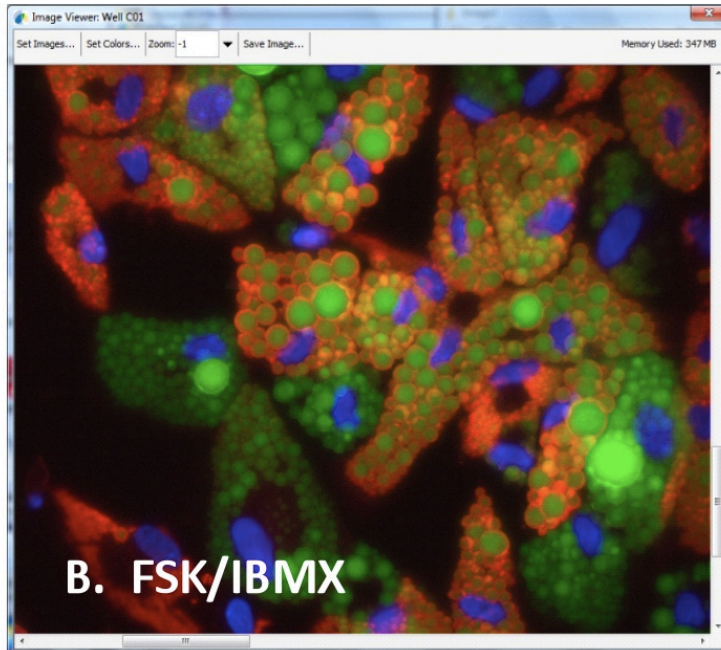
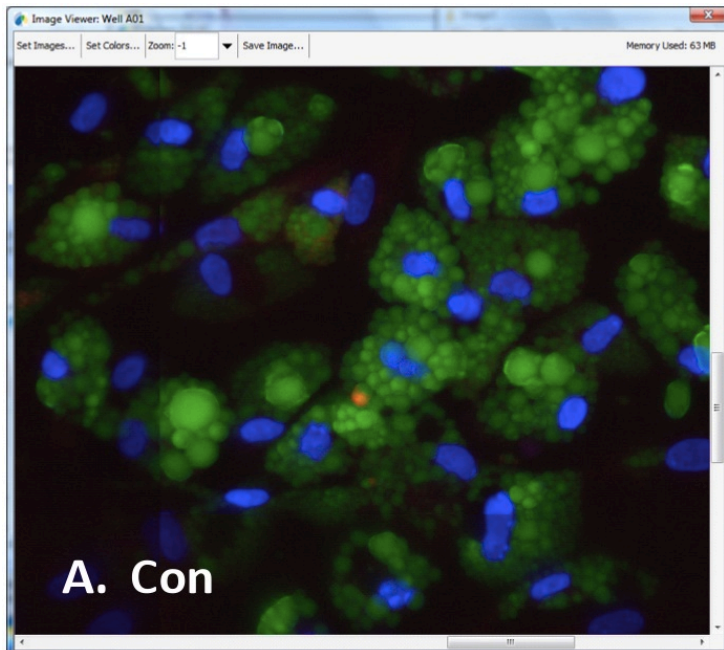


Figure 2. Assay of phosphorylated perilipin via immunocytofluorescence. Human subcutaneous adipocytes labeled for nuclei (blue), lipid droplets (green), and perilipin (red), using Vala Sciences' phospho-perilipin specific monoclonal antibody. A, Cells exposed to control medium. B, Cells exposed to 10 μ M FSK + 500 μ M IBMX for 2 minutes.

Available Testing Service To Analyze of Lipid droplet and Lipid Droplet Associated Proteins

phenotype due to reduced accumulation of fat(4, 5), suggesting that perilipin may have a “gate-keeper” function under basal conditions to protect the triglycerides from metabolism by lipases. Conversely, perilipin is subject to phosphorylation by cyclic-AMP-dependent protein kinase, and phosphorylation of perilipin helps to recruit Hormone Sensitive Lipase (HSL) to the lipid droplets, an important step in the initiation of lipolysis (Figure 1A).

Given the ever increasing interest in elucidating the mechanisms that regulate lipolysis, Vala Sciences Inc is proud to introduce two new monoclonal antibodies that are excellent at visualizing perilipin in immunocytofluorescence labeling applications. The first antibody (Figure 1B) recognizes perilipin

whether or not lipolytic pathways have been activated in the cell. Labeling with the antibody is exceptionally specific, with virtually no background, and the labeling pattern is very tightly associated with the outer surface of the lipid droplets, as expected for perilipin.

The second monoclonal antibody selectively recognizes perilipin that has been phosphorylated on serine 497, a site of PKA-mediated phosphorylation (Figure 2). Thus, for the first time, a tool is available in which phosphorylated perilipin can be visualized in fixed cells via immunocytofluorescence labeling procedures and fluorescence microscopy. This antibody is expected to be of high interest to researchers investigating hormonal control of lipolysis.

References

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VALA PERILIPIN AND PHOSPHOPERILIPIN ANTIBODIES

PRODUCT DESCRIPTION	QTY	PART #
Anti-Perilipin mouse IgG1 monoclonal immunogen: peptide near serine 497 of human perilipin species recognized: human, mouse	100 μ l	4854
Anti-Phosphoperilipin mouse IgG1 monoclonal immunogen: peptide near serine 497 of human perilipin species recognized: human, mouse	100 μ l	4855