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Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering

Process for obtaining spherical immunosorbents of silicon dioxide-3-carboxymethyloxime-nandrolone

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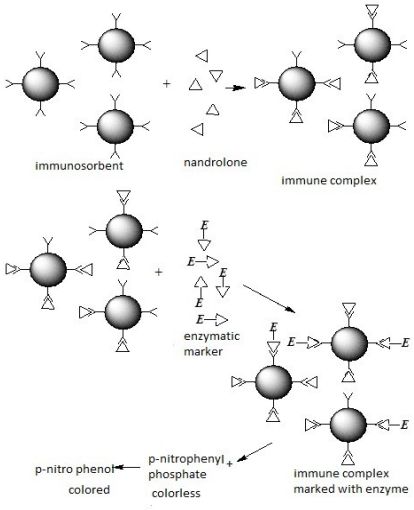
Abstract

The invention relates to a process for obtaining spherical immunosorbents of silicon dioxide-3-carboxymethyloxime-nandrolone, used in ELISA technique for dosing of chemical food contaminant nandrolone from biological liquids. **ELISA** (Enzyme Linked Immunoasorbent Assay) is an immunoassay that use antibodies to measure the small concentration of an analyte in some microliters of sample (nanogram, picogram, femtogram). The principle's technique is based on the ability of non-labeled antigen Ag. (e.g. hormone) in a specific volume of standard solution or in an unknown sample to complete with a fixed amount of enzymatic labelled antigen Ag* for a limited number of binding sites of a specific binding antibody protein Ab. **Nandrolone (19-Nortestosterone)** is androgenic growth promoter and can be used to accelerate the growth rate of animals so that they can be brought to market earlier. The most effective growth promoters are natural sex hormones or substances that imitate the action of natural hormone. When nandrolone have been abused has resulted in high levels of residues in different foods, e.g. beef, pork and veal liver. The side effects from hormone residues include: breast enlargement, premature cessation of pubertal development and ovarian cysts in children. In view of these potential health hazards, it is important that foods be monitored for hormone residues. Due their very low concentration in animal products, these chemical compounds can be easily determined by immunoassay technique ELISA. About 70% contaminants are carried by food, 20% by water and 10% by air and represent hazards for the human health.

Technology stage

The obtained product can be used in ELISA immunochemical technique for dosing of nandrolone steroid from biological samples and it was validated in ELISA dosing technique.

Graphic representation of the method



Applications

- ELISA kits for detection of androgenic growth promoter, nandrolone from food samples which leads to increased quality of life by using uncontaminated food;
- Human and veterinary endocrinology: quantitative determination of concentrations of anabolic substance;
- Biochemical industry.

Advantages

- by using glass spheres with functionalized controlled surface one can covalently coupled to their surface a predetermined number of nandrolone molecule through a very stable link;
- nandrolone antigen binding surface of the glass does not change the simple structure of this molecule in comparison with immunoglobulin IgG antibody covalently linked with an extremely complex structure and therefore stable in terms of affinity and avidity, homologous antigen recognition characteristics;
- **Specificity-** detect specific and measure antigen in extreme and complex mixture;
- **Sensitivity-** measure low concentrations of some chemicals;
- **Rapidity-** 50 samples in 1-2 hours, use aqueous solution and not organic solvents.

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