and products of animal origin. Detection of organochlorine pesticide residues was realised through the method SANTE/11813/2017 using gas chromatography with electron capture detector. The results showed that 35 samples (76,1%) were free of residues, 7 samples (15,2%) with residues less than the maximum allowed limit and 4 samples (8,7%) have registered values near to the maximum admissible limit, but without exceed. Of these 4 samples, a sample was of animal origin and 3 samples of vegetables, more exactly, *Lactuca sativa*.

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Accelerate adherent animal cell growing in serum-free medium suspension culture

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Animal cell factory comes superior over microbial one for a perfect protein folding and glycosylation production. However, animal cell culture has some limitations including a high cost, lower growth, complexity of media recipe, and demand of serum. Suspension culture mode provides a higher cell density and lower cultivation time in the production process compared with adherent one. Therefore, adapting cells in suspension serum-free medium would represent the best choice to reduce the process cost and improve productivity. Herein, sequential adaptation method was applied for removing serum completely and switching two dimensions 2D (adherent) to 3D (suspension) HeLa cells. This occurred by decreasing in serum-enriched medium (Ham's F12 +10% FBS) with increasing SMIF-6 and spinner-flask cultivation, respectively. Cell morphology and viability were monitored under phase contrast microscope.

The results emphasize successful free suspension cells production after ten passages of a transition from 2D to 3D culture. HeLa cells revealed flattened triangular shape in T-flask and spherical rigid cell membrane in a spinner-flask. Growth behaviour and metabolic activity (glucose and lactate metabolites) have no significant changes during adaptation process. Accordingly, this technique paves the way for further development in recombinant protein production, e.g. TGF-β1, which has a positive impact on cancer therapy.

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Myeloid stimulating activity of extracts from plants of the family Chenopodiaceae

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Flowering whole plants of family Chenopodiaceae were collected from the piedmont steppe of the Toraigir Mountains of the Almaty region of Republic Kazakhstan. Were elaborated technological schemes of obtaining and chloroform compositions from four plant species of family Chenopodiaceae: Halostachys caspica (Pall) C.A. Mey ex Schrenk, Suaeda microphylla (Pall) Botsch, Climacoptera Obtusifolia (Schrenk) Botsch, Climacoptera brachiata (Pall) Botsch. Extraction of plants was performed in aqueous-alcoholic solution under a pressure of from 150 to 400 bar. With increasing pressure in the extract increased the amount of alkaloids, flavonoids, saponins and glycosides. The herbal extracts from plants Halostachys caspica (Pall) C.A. Mey ex Schrenk, Suaeda microphylla (Pall) Botsch showed pronounced erythropoiesis stimulating and thrombocytopoiesis stimulating activity. The obtained plant extracts from Climacoptera Obtusifolia (Schrenk) Botsch, Climacoptera brachiata (Pall) Botsch plants showed cytostatic effect. The results and further studies show the perspective for the development of erythropoiesis stimulating and thrombocytopoiesis stimulating drugs from plants Halostachys caspica (Pall) C.A. Mey ex Schrenk, Suaeda microphylla (Pall) Botsch.

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High copy number plasmid engineering for biopharmaceutical-grade pDNA production in Lactococcus lactis

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The Generally Recognized As Safe bacterium, Lactococcus lactis is a safer and cost-effective alternative to the lipopolysaccharide-producing Escherichia coli as a cell factory for pharmaceutical-grade plasmid production. Such plasmids are used in biotechnological and pharmaceutical applications, such as the production of DNA vaccines and recombinant proteins and also for the use of food-grade bacteria in live mucosal vaccination. The lack of a plasmid able to replicate with a high copy number in L. lactis urged us to engineer the Ribosome Binding Site (RBS) of the repDE promoter of the pAMβ1-based pTRKH3 plasmid, using site-directed mutagenesis. From the six designed mutants, the pTRKH3-b was the most promising candidate, achieving 215(±38) copies of plasmid per chromosome, a 3.5-fold increase from the non-modified pTRKH3 (62 ± 5) ($p < 0.05$), determined by quantitative real-time PCR. This effectiveness was due to a combination of a