[12] Figure 3 is a graphical depiction of increase in tropoelastin content murine skin using a composition of the invention.

[13] Figures 4-6 are graphical depictions of comparative scores for elastin content, epidermal thickness and hypodermal fat, for a composition of the invention as compared to a control.

[14] Figures 7-11 are depictions of test results on increase in skin elasticity by surface application of compositions of the invention, using graphs and photographs.

[15] Figure 12 is a graphical depiction of cross sectional elastin content after a 21-day topical application of zinc or control.

[16] Figure 13 contains graphical depictions of information from experiments conducted to investigate the effects of concentration on elastin production.

SUMMARY ~~OF THE INVENTION~~

[17] The present ~~invention~~disclosure relates to zinc-containing compositions and methods, particularly topical methods, which are employed to achieve one or more of several effects, including increasing or decreasing epidermal thickness, increasing elasticity or elastin levels, and increasing or decreasing fat in or near the skin. While we do not wish to be bound thereby, it is believed that these formulations and methods provide such results by supplying increased local ionic zinc concentrations to the relevant tissues.

[18] In general, the ~~invention~~disclosure comprises a method for altering the properties of tissue of a subject, said altering being selected from the group consisting of increasing fat content in said tissue, decreasing fat content in said tissue, increasing epidermal thickness, decreasing epidermal thickness, and increasing elastin content in said tissue, said method comprising applying a dermatologically or pharmaceutically acceptable composition consisting essentially of one or more zinc-containing components (e.g. zinc compounds, complexes and/or chelates) in admixture with a dermatologically or pharmaceutically acceptable carrier, in an effective tissue-modifying amount to one or more sites on said tissue in need of said modifying.

[19] More specifically, in one ~~aspect~~embodiment the ~~invention~~disclosure comprises a method for increasing fat production in the skin (i.e., "superficial fat") or beneath the skin (i.e., "deep fat") of a subject, which comprises topically applying a dermatologically or pharmaceutically acceptable composition consisting essentially of one or more zinc-containing components in admixture with a dermatologically or pharmaceutically acceptable carrier, in an amount effective to

increase fatty tissue, to a site on the subject in need of increased fat. In another ~~aspect~~embodiment the ~~invention~~disclosure comprises a method for decreasing fat production in or beneath the skin, which comprises topically applying a dermatologically or pharmaceutically acceptable composition consisting essentially of one or more zinc-containing components in an amount effective to decrease fatty tissue to a site on the subject in need of decreased fat. By increasing or decreasing fatty tissue is meant to increase or decrease the mass of fatty tissue, which may be done by affecting either the number of adipocytes or the size of individual existing adipocytes.

[19a] In one aspect, there is provided the use of one or more zinc-containing components in the manufacture of a topical medicament for increasing elastin in skin, wherein the topical medicament comprises one or more zinc-containing components in an admixture with a dermatologically or pharmaceutically acceptable carrier;

wherein the one or more zinc-containing components is selected from the group consisting of zinc acetate, zinc ascorbate, zinc aspartate, zinc butyrate, zinc caproate, zinc caprylate, zinc carbonate, zinc chromate, zinc citraconate, zinc citramalate, zinc citrate, zinc EDTA, zinc formate, zinc fumarate, zinc gallate, zinc gluconate, zinc halides, zinc iodate, zinc lactate, zinc laurate, zinc laureate, zinc malate, zinc maleate, zinc malonate, zinc metaphosphate, zinc methanesulfonate, zinc monophosphate, zinc myristate, zinc nitrate, zinc octoate, zinc oleate, zinc orotate, zinc orthophosphate, zinc oxalate, zinc palmitate, zinc permanganate, zinc phenolsulfonate, zinc phosphate, zinc picolinate, zinc propionate, zinc pyrophosphate, zinc salicylate, zinc selenate, zinc stearate, zinc succinate, zinc sulfate, zinc sulfonate, zinc tartrate, zinc tetrametaphosphate, zinc titanate, zinc transferrin, zinc tripolyphosphate, zinc undecylate, zinc valerate, zinc amino acid complexes, zinc nucleotide complexes, and mixtures thereof,

and wherein zinc is present in the topical medicament in a concentration range from about 10 μM to about 1 mM, inclusive.

[19b] In one aspect, there is provided one or more zinc-containing compositions for use in increasing elastin in skin, wherein the composition comprises one or more zinc-containing components in an admixture with a dermatologically or pharmaceutically acceptable carrier;

wherein the one or more zinc-containing components is selected from the group consisting of zinc acetate, zinc ascorbate, zinc aspartate, zinc butyrate, zinc caproate, zinc caprylate, zinc carbonate, zinc chromate, zinc citraconate, zinc citramalate, zinc citrate, zinc EDTA, zinc formate, zinc fumarate, zinc gallate, zinc gluconate, zinc halides, zinc iodate, zinc lactate, zinc laurate, zinc laureate, zinc malate, zinc maleate, zinc malonate, zinc metaphosphate, zinc methanesulfonate, zinc monophosphate, zinc myristate, zinc nitrate, zinc octoate, zinc oleate, zinc orotate, zinc orthophosphate, zinc oxalate, palmitate, zinc permanganate, zinc phenolsulfonate, zinc phosphate, zinc picolinate, zinc

propionate, zinc pyrophosphate, zinc salicylate, zinc selenate, zinc stearate, zinc succinate, zinc sulfate, zinc sulfonate, zinc tartrate, zinc tetrametaphosphate, zinc titanate, zinc transferrin, zinc tripolyphosphate, zinc undecylate, zinc valerate, zinc amino acid complexes, zinc nucleotide complexes, and mixtures thereof,

and wherein zinc is present in the composition in a concentration range from about 10 μM to about 1 mM, inclusive.

[19c] In ~~a third aspect~~one embodiment the ~~invention~~disclosure comprises a method for increasing elastin content in a tissue of a subject (including but not limited to the skin), which comprises topically applying to said tissue a dermatologically or pharmaceutically acceptable composition consisting essentially of one or more zinc-containing components in admixture with a dermatologically or pharmaceutically acceptable carrier in an effective elastin-increasing amount.

[19d] ~~A fourth aspect of~~In one embodiment, the ~~invention~~disclosure comprises a method for increasing epidermal thickness in a subject, the method comprising topically applying a dermatologically or pharmaceutically acceptable composition consisting essentially of one or more zinc-containing components in admixture with a dermatologically or pharmaceutically acceptable carrier in an effective epidermal thickness-increasing amount, to an area of the skin of the subject in need of increased epidermal thickness. In another ~~aspect~~embodiment, the ~~invention~~disclosure comprises a method for decreasing epidermal thickness in a subject, which comprises topically applying a dermatologically or pharmaceutically acceptable composition consisting essentially of one or more zinc-containing components in admixture with a dermatologically or pharmaceutically acceptable carrier to an area of the skin of the subject in need of decreased epidermal thickness.

[20] Yet another ~~aspect~~embodiment of the ~~invention~~disclosure comprises a method for increasing elastin content of the lens of an eye of a subject comprising placing over the lens a contact lens comprising one or more zinc-containing components, whereby the contact lens releases zinc ions onto the locus of the lens of the eye and/or adjacent tissues (such as muscles) in an effective elastin-increasing amount. Such a lens, itself, also comprises an ~~aspect~~embodiment of this ~~invention~~disclosure.

[21] In other ~~aspects~~embodiments, the ~~invention~~disclosure comprises dermatologically and/or pharmaceutically acceptable compositions for the above methods and purposes, containing, or consisting essentially of, an amount of one or more zinc-containing components effective for the purpose in question, and also comprising one or more dermatologically and/or pharmaceutically acceptable carriers.

5. The use according to any one of claims 1-4, wherein the one or more zinc-containing components is present in the topical medicament in a concentration range of 900 μM to about 1 mM, inclusive.

6. The use according to any one of claims 1-5, wherein the zinc is present at a concentration of 1 mM.

7. The use according to any one of claims 1-5, wherein the zinc is present at a concentration 100 μM.

8. The use according to any one of claims 1-7, wherein the topical medicament consists essentially of the one or more zinc-containing components.

9. The use according to any one of claims 1-8, wherein the topical medicament contains zinc citrate.

10. The use according to any one of claims 1-8, wherein the topical medicament contains zinc carbonate.

11. The use according to any one of claims 1-8, wherein the topical medicament contains zinc acetate.

~~12. Use of one or more zinc-containing compositions for increasing elastin in~~ skin, wherein the composition comprises one or more zinc-containing components in an admixture with a dermatologically or pharmaceutically acceptable carrier;

wherein the one or more zinc-containing components is selected from the group consisting of zinc acetate, zinc ascorbate, zinc aspartate, zinc butyrate, zinc caproate, zinc caprylate, zinc carbonate, zinc chromate, zinc citraconate, zinc citramalate, zinc citrate, zinc EDTA, zinc formate, zinc fumarate, zinc gallate, zinc gluconate, zinc halides, zinc ~~iodate, zinc lactate, zinc laurate, zinc laureate, zinc malate, zinc maleate, zinc malonate,~~

~~zinc metaphosphate, zinc methanesulfonate, zinc monophosphate, zinc myristate, zinc~~ nitrate, zinc octoate, zinc oleate, zinc orotate, zinc orthophosphate, zinc oxalate, zinc palmitate, zinc permanganate, zinc phenolsulfonate, zinc phosphate, zinc picolinate, zinc propionate, zinc pyrophosphate, zinc salicylate, zinc selenate, zinc stearate, zinc succinate, zinc sulfate, zinc sulfonate, zinc tartrate, zinc tetrametaphosphate, zinc titanate, zinc transferrin, zinc tripolyphosphate, zinc undecylate, zinc valerate, zinc amino acid complexes, zinc nucleotide complexes, and mixtures thereof,

and wherein zinc is present in the composition in a concentration range from ~~about 10 μM to about 1 mM, inclusive.~~

12~~13~~. One or more zinc-containing compositions for use in increasing elastin in skin, wherein the composition comprises one or more zinc-containing components in an admixture with a dermatologically or pharmaceutically acceptable carrier;

wherein the one or more zinc-containing components is selected from the group consisting of zinc acetate, zinc ascorbate, zinc aspartate, zinc butyrate, zinc caproate, zinc caprylate, zinc carbonate, zinc chromate, zinc citraconate, zinc citramalate, zinc citrate, zinc EDTA, zinc formate, zinc fumarate, zinc gallate, zinc gluconate, zinc halides, zinc iodate, zinc lactate, zinc laurate, zinc laureate, zinc malate, zinc maleate, zinc malonate, zinc metaphosphate, zinc methanesulfonate, zinc monophosphate, zinc myristate, zinc nitrate, zinc octoate, zinc oleate, zinc orotate, zinc orthophosphate, zinc oxalate, palmitate, zinc permanganate, zinc phenolsulfonate, zinc phosphate, zinc picolinate, zinc propionate, zinc pyrophosphate, zinc salicylate, zinc selenate, zinc stearate, zinc succinate, zinc sulfate, zinc sulfonate, zinc tartrate, zinc tetrametaphosphate, zinc titanate, zinc transferrin, zinc tripolyphosphate, zinc undecylate, zinc valerate, zinc amino acid complexes, zinc nucleotide complexes, and mixtures thereof,

and wherein zinc is present in the composition in a concentration range from about 10 μM to about 1 mM, inclusive.