

Hormones, the scariest of them all!

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At the core of the actions and behaviours of our favorite monsters are hormones which are the most powerful substances in our bodies. Hormones (from the Greek, ὄρμη, meaning "impetus" or "set in motion") are a class of regulatory biochemicals produced by endocrine glands in our bodies and transported by the circulatory system to a distant target. The field of endocrinology is the study of hormones. Hormones control and regulate all of our biological responses, both physiology and behavior. As such hormones are a major form of communication between all the cells and organs of our body. Hormones regulate a variety of physiological and behavioral activities, including digestion, metabolism, respiration, tissue functions, sensory perception, sleep, excretion, lactation, stress, growth and development, movement, reproduction and mood. Generally, only a small amount of hormone is required to alter cell metabolism. Hormones are also a silent driver of behavior and personality. As one endocrinologist put it, hormones are responsible for the "four 'F's" of flight, fight, food, and sex!

Some examples of endocrine glands are the adrenals, thyroid, ovaries, pituitary, testes, thymus, and pancreas. Other examples are the hypothalamus, and pineal gland. Hormones are responsible for determining an animal's sex, size, shape, organ structure, and ability to respond to the environment. This not only equally applies to us humans but also to some of our favorite SF monsters. As a strict definition a hormone is any molecule made by one cell that is transported via the circulatory system to a different cell to work. And the endocrine system is so complex that the same hormone behaves radically differently from person to person. In animals, the brain is often a target organ for many of these hormones, and the brain, in turn, regulates the secretion of these hormones. Also, certain hormones can also regulate other hormones. Complex and scary indeed.

Hormones are mostly produced by specialized cells in endocrine glands like the hypothalamus, adrenals, thyroid, and pancreas. Specific biochemical signals can induce a wide range of hormone production which in turn, as mentioned above, can affect a wide range of regulatory and behavioral systems. And the rate of these hormonal changes and influences can also widely range from immediate to long term depending upon the specific hormone.

Once a hormone is made (or synthesized) it gets transported through the circulatory system to home in on its target, called a hormone receptor. If the hormone, such as a protein hormone like insulin, is water soluble it is readily

transported through the blood stream. If the hormone is not water soluble like most steroid and thyroid hormones, then they must piggyback other biomolecules for transport through the circulatory system. Also, some hormones are completely active when released into the blood stream (like insulin) whereas others must be activated through a series of coordinated steps.

Hormone history

The early history of hormones had a shaky start. The initial impetus began with efforts at rejuvenation and attempts to restore physical, mental, and sexual youth. In 1889 a 72-year old physiologist, Charles Edouard Brown Sequard (1817-1894), reported an improvement of his frail health after injecting himself with dog and guinea pig testicular extracts. Shortly afterwards more or less every conceivable tissue became the 'cause celebre' for essentially every conceivable disorder. The focus was soon on the 'mysterious secretions' of ductless glands, especially the sex glands, and serious experimental research began that by the end of World War I was well on the way to being defined. One popular medical publication from the 1920s stated, "that the abnormal functioning of these ductless glands may change a saint into a satyr; a beauty into a hag; a giant into a pitiful travesty of a human being; a hero into a coward; and an optimist into a misanthrope." It should be noted that all these above comments pertain to the down side of hormones. It could also be said that hormones can change a satyr into a saint, a hag into a beauty, and a coward into a hero.

During the heady endocrine research days of the 1920s the expectations were that hormones would provide a revolutionary way to improve human life. A major part of this work at the time was the use of 'monkey glands' or more specifically ape testicles. One prominent surgeon, Dr. Serge Voronoff (1866-1951), implanted ape testicles into ageing men that perhaps was the most notorious of the monkey gland work at the time. Voronoff also claimed that by surgically grafting the glands of animals into other animals, including humans, he could correct some birth defects and help prolong life. Eventhough extreme these innovative studies helped to establish the difference between male and female hormones and how they influenced male and female development. In other words, by manipulating the sex glands and their secretions characteristics of humans can be affected that are not genetically determined.

How hormones work

Hormones work in tiny amounts so small changes can affect major changes in the body. Even a slight excess or a slight deficiency of a hormone can lead to disease states. In mammals, including humans, most protein hormones bind to a specific membrane-embedded receptor on its target tissue which in turn elicits specific cellular events to occur. A hormone binding to a specific receptor is very much like a certain key that fits a specific lock and only that key will open its specific lock. That being said the hormone can only work if its specific receptor is present on the target tissue; no target then no response no matter how much hormone is present (likewise, no matter how many duplicate keys you have

without the specific lock there is nothing to open). And the converse is also true in that the target tissue can have many receptors but with no hormone to activate it then it remains silent so the concentration of the hormone is important. Also, a cell may have several different receptors that can either recognize the same hormone or several different receptors for completely different hormones. The specific hormone receptors can be found on many different types of tissues such as with insulin where the insulin receptor is on a variety of cell types that triggers a diverse range of responses. While not wanting to make this more complicated these hormones can either all activate the same biochemical pathways or activate different pathways for different physiological responses. Hormones are the ultimate regulators.

Once a hormone binds to its specific receptor a series of protein triggers are activated by what are collectively called signal transduction mechanisms (via a cascade of biochemical events) that leads to the activation of a series of genes that control cell and tissue physiology. This could also include the production of additional hormone receptors that in turn could bind even more hormones thereby making an even greater biological response. Overall, hormones tend to increase, or up-regulate, protein synthesis in cells.

For non-protein hormones such as steroid or thyroid hormones their receptors are typically located within their target cells (a cell area called the cytoplasm) so they must cross the cell membrane to enter. This combined hormone-receptor complex then binds to certain DNA genes to either activate or suppress them.

Hormonal signaling

Signaling of a hormone involves the biosynthesis of the particular hormone, its storage and secretion, the transport of the hormone to its target cell(s), the recognition of the hormone by its specific receptor, the relaying and amplification of the hormonal signal (usually the binding of the hormone to its receptor) which in turn leads to a defined cellular response. Lastly is the degradation of the hormone when it is done doing its job. An important consideration here is the concentration of the hormone-receptor complex which are determined by three factors: physiology, effects, and structure. The concentration affects the level of signaling and therefore the level and intensity of the response. Furthermore, there are also natural feedback mechanisms in place that help maintain a homeostasis of hormonal balance so when an overproduction occurs it can be naturally dissipated or neutralized.

Physiological effects

Hormones are defined functionally, not structurally, so they may have diverse chemical structures even though they work on the same target. In mammals hormones have the following effects: stimulation or inhibition of overall growth, wake-sleep cycles (both circadian (24 hr cycles) and hemi-circadian (12 hr cycles) rhythms), mood swings, control of programmed cell death, control of the immune system, regulation of metabolism, hunger cravings, mating, fighting,

fleeing, puberty, parenting, menopause, and control of the reproductive cycle. Furthermore, since some hormones also regulate the production of other hormones then under normal conditions an overall homeostasis is achieved.

Hormone secretion can be stimulated or inhibited by other hormones, by the concentration of nutrients in blood, by neural activity (including mental activity), and by environmental changes (such as with temperature or light). In addition there are both natural and synthetic chemical compounds that have hormone-like effects. At times these compounds change the body homeostasis as effectively as natural hormones.

In our bodies the effects caused by hormones are concentration dependent meaning the more the hormone then the more the effect. Also involved in behavior issues are the release patterns of the hormones, the location of the hormone receptor, as well as their efficiency in bringing about changes; some occur in seconds whereas others may take years to see effects. Furthermore, the environment also highly influences hormone expression and function. A feedback mechanism works in that behavior influences hormone expression and hormone expression influences behavior.

Chemical classes of hormones

In animals, including humans, hormones are of three major categories. Peptide hormones, lipid, or a monoamine. Peptide hormones are made of chains of amino acids, examples being thyroid releasing hormone, endorphins, and vasopressin. Longer peptides, upwards of hundreds of amino acids are considered proteins, such as insulin and growth hormone. The main class of lipid hormones are steroids such as estrogen, testosterone and cortisol. Another example are the prostaglandins that are involved in smooth muscle contraction and relaxation. The monoamines are all derived from amino acids like phenylalanine, tyrosine, and tryptophan and function as neurotransmitters.

Hormones and diseases

Diseases and disorders of hormones can be readily diagnosed both in the clinic as well as the laboratory. There are many lab tests available that can accurately measure levels of hormones in body fluids like blood, urine, and saliva to monitor hormone health. Not only are hormone overproductions a health issue but also hormone deficiencies. In some cases, hormone replacement therapy is used to compensate for deficiencies and some medications are available to inhibit some over production of other hormones. For example, those deficient in insulin production, like diabetics, can receive insulin replacement therapy and those with an overactive thyroid can be treated with a synthetic drug (e.g, propranolol) that counteracts the effects of excess thyroid hormone.

Many hormones and their synthetic analogs are used for medication with the most common being estrogens, progestagens (birth control), thyroxine (for hypothyroids), and steroids (mostly for autoimmune diseases). The hormone

insulin is used for diabetics. Typically a pharmaceutical dose of a given hormone is usually much larger than what naturally occurs in the body so the overall response may also be different and beneficial. However, it should be noted that hormone medications do have some potentially harmful side effects.

Pineal gland

The pineal gland is a small endocrine gland located in the brain and produces melatonin, a hormone that affects sleep patterns in circadian rhythms. Its shape resembles a pine cone (where its name came from) and is about the size of a grain of rice and located in the epithalamus near the center of the brain. (Just so you gentle readers know, the alligator lacks a pineal gland; see: THE ALLIGATOR PEOPLE, below.)

The philosopher, Rene Descartes, believed the pineal gland to be the “principle seat of the soul”. Its location deep within the brain suggested to philosophers that it must have some significance. This is why it has been regarded as somewhat of a “mystery gland” with mystical and occult overtones about its perceived function. Another popular term for the pineal gland is the “third eye” since it has been compared to the photoreceptive parietal eye present in some animal species. There is some support for this since pineal cells possess a common evolutionary ancestor with retinal (eye) cells. The pineal gland was originally believed to be a vestigial remnant of a larger organ so there has been a mystique about this gland for some time. Overall, the hormonal substance from pineal glands, melatonin, has not been proven to be especially useful.

Melatonin is a derivative of the amino acid, tryptophan and its production by the pineal gland is stimulated by darkness and inhibited by light, all a part of the body's natural circadian rhythms. When puberty arrives the production of melatonin is reduced so it seems that pineal gland secretions inhibit the development of reproductive glands (see: THE LEECH WOMAN below). In addition to its role in sexual development the pineal gland is also involved in hibernation in animals, their metabolism and seasonal breeding. As humans approach adulthood the pineal gland undergoes calcification and continues this process during ageing. Some think the pineal gland calcification contributes to Alzheimer's disease.

Pituitary Gland

In humans, the pituitary gland or hypophysis is a hormone gland about the size of a pea, though located at the bottom of the hypothalamus in the lower center of the brain, it is not a part of the brain. The pituitary gland consists of two components, the anterior pituitary and the posterior pituitary, and in total secretes 9 different hormones. The hypothalamus releases various growth factors to the pituitary gland which in turn stimulates the release of the pituitary hormones. As such, the pituitary is known as the ‘master endocrine gland’. Some of the hormones the pituitary gland secretes are the somatotrophins (also known as HGH or human growth hormone), thyroid-stimulating hormone (TSH), endorphins

(see: DARK ANGEL, below), prolactin, melanocyte-stimulating hormone (influences skin pigmentation), vasopressin, and oxytocin (increases labor contractions in women).

Phytohormones

Plant hormones are known as phytohormones which are chemicals or signal molecules that regulate plant growth. Plant hormones are not nutrients. Plant hormones determine the formation of flowers, stems, leaves (and the shedding of leaves), and the development and ripening of fruit. Plant hormones affect seed growth, time of flowering, the sex of flowers, senescence of leaves and fruits. They also affect how plant tissues grow upward as well as downward including longevity. Plants could not survive without hormones. Plant hormones are simple chemicals and not the complex biomolecules seen in mammals. It should also be noted that not all plants respond to hormones.

Classes of plant hormones

There are 5 classes of plant hormones that can vary from plant to plant and their chemical structures are significantly different suggesting specific and defined actions. Each class has positive as well as inhibitory functions that often work in tandem. The five major classes are: abscisic acid (an important plant growth regulator produced in leaves, especially when plants are under stress. It plays a role in leaf and seed dormancy by inhibiting growth.), auxins (influence cell enlargement, bud formation (converting stems to flowers) and root initiation.), cytokinins (a group of chemicals that influence cell division and shoot formation), ethylene (a gas produced as a metabolic breakdown product that influences leaf expansion, stem diameter and height. It also affects fruit-ripening.), and gibberellins (a large range of chemicals important in seed germination, promoting flowering, and growth of new cells). Though there are other known plant hormones they are highly specialized for specific plants such as defense mechanisms, pollen compatibility, shoot branching, and nitrogen fixation.

In addition to the above there are also synthetic plant hormones that are used for plant propagation from cuttings, grafting, and various tissue culture procedures.

My hormones made me do it!

In many SF films the drug or 'treatment' by the scientist ultimately works via hormones. The drug, etc. acts as a messenger that sends or stimulates a particular biological signal for other things to happen. For example, all the SF drugs or radiation exposures that selectively stimulates the production of growth hormone (plant, insect, or animal/human) results in a proportionately uniform response. One major flaw in this is how to *selectively* direct the hormone production to either certain species and/or certain parts of a particular organism, irrespective of its size. Overall uniform growth, such as in gigantism, is easy to understand but selective growth either as a population (such as seen in THEM!) or as an individual (Col. Manning; see below) is not so easy. Complicated

biochemical and genetic programming would be necessary to actually achieve the effects seen in the films.

Many of the behaviors of our favorite screen monsters can be attributed to raging hormones. And since hormones work in miniscule small amounts then it doesn't take much to affect behaviour, all behaviors. And if someone or something has a large amount of hormones coursing through their bodies then much mayhem will result. No wonder many of our favorite cinemonsters are angry...their hormones are out of balance! Mood swings are typically due to hormones gone wild or simply put they suffer from "raging hormones".

Glands and early cinema

Films reflect and mirror the times in which they were produced irrespective of the genre. During the early part of the 20th Century when the film industry was just getting its legs the popular science of the day was all about glands and gland extracts and how they could "restore youth" and "bring vigor back to life" (the proverbial 'Fountain of Youth' is nothing more than a bath of hormones). This reflected the new science of endocrinology at the time when many of the hormones were beginning to be discovered and this pop science was brought to films as plot devices. During the 1920s through the 1930s the use of gland and gland extracts were popular fodder for film plots. Film examples of this are MURDERS IN THE RUE MORGUE, THE MONSTER MAKER, and THE APE MAN. So, during the early days of SF cinema it was all the rage to have mad scientists conducting glandular and hormonal experiments and to talk about "glands" and what they can do to greatly improve health and well being.

During the early 20th Century the "restoration of youth" was simply a 'promise' for older men to regain their youth by being able to have sex. In other words, the use of testosterone (simply thought of as male hormones at the time) could make old men virile again like they were during early manhood.

After it was understood that hormones are produced from glands the cinema concepts changed to incorporate that understanding. Though the plot drivers were the same, namely the use of biological material to affect certain changes, the means to do so have changed. As the public's understanding of science became more sophisticated after World War II the film plots matched this sophistication and began to use more complicated biology and hormones were a key part of this.

In SF films most of the hormonal effects, either directly or indirectly implied, are somewhat limited to either growth hormone (gigantism) or androgens like testosterone (superstrength and virility). The myriad of other hormones are mostly ignored in SF cinema. Even a condition as common as diabetes is limited in scope in SF films. One possible interpretation is no real monster can be created through the use of most hormones. Imagine "The Diabetes Monster", or

“The Thyroid Terror”, or possibly “The Hypothalamus Horror” and it may be difficult to get producers interested.

When scientific research advanced from glands to actual hormones during the 1920s to late 1930s, a period when the actual hormone biomolecules were defined and understood, film plots followed. As mentioned, prior to World War II hormonal effects were described as “glands” and “glandular effects”. At the era of WWII when biomedical research had advanced through the initial discoveries and wonders of hormones then the word, “hormone” began to appear in film scripts. For example, in the 1942 film, THE CORPSE VANISHES, the phrase “glands and hormones” was used and is one of the first to use of the word, ‘hormone’, in SF films. This suggests that early 1942 script writers, such as Harvey Gates, who penned TCV, were up-to-date with then current science. All in all script writers remained contemporary and new science discoveries quickly made it into SF film plots.

THE FILMS

DR. JEKYLL AND MR HYDE (1932)

many hormonal effects

There are many filmed versions of the Robert Louis Stevenson classic and one of the best is the 1932 version starring Frederic March, who won an Academy Award for his performance.

The potion that caused the changes from Jekyll to Hyde induced a massive hormonal imbalance resulting in many physical and emotional changes. Many hormones were affected including those that regulate skin tone, teeth, hair growth, as well as behavioral changes. His libido became dominant (more testosterone) and he no longer suppressed any urges. At first the hormonal changes were temporary and Jekyll reverted back to Hyde after consuming a counter-potion which would be a hormone suppressor. After getting used to the various transformations his brain took over and spontaneously released a storm of hormones that caused the change to Hyde thereby bypassing the need for the ‘chemical trigger’ like the potion he drinks. Each change into Hyde (there were 5 in total) brought about a more severe physical and emotional change suggesting the hormone imbalance became the readily adapted new norm.

ISLAND OF LOST SOULS (1933)

Gland and gland extracts (growth hormone, estrogens)

“What is the law?” intones the Sayer of the Law. Well, the law is actually hormones. The legacy of Doctor Moreau in the 1933 film is one primarily of hormones that he used to create his manimals. Surgery was performed on his beasts but the main driving force was hormones. Since hormones work in a transient or temporary way they therefore must constantly be used to maintain their effects (think of a diabetic who must take the hormone, insulin, every day). Which is why Lota, Moreau’s “most nearly perfect creation” did revert back (“stubborn beast flesh...creeping back”) to her natural state when the hormone

treatments stopped. To keep the beasts changing Moreau needed to keep injecting hormones and perhaps some received too much giving them raging hormones that reverted them back to their animal instincts.

THE APE (1940)

Nerve growth factor

Dr. Adrian (Boris Karloff) uses the spinal fluids of humans to help a paralyzed girl walk again. Initially, Adrian uses spinal fluids from an ape that were shown to be effective. Injecting gorilla spinal fluid into a human would be an interesting experiment since the similarity between human proteins and gorilla proteins is very close. Human and ape proteins are about 98.5% similar. The original gorilla spinal fluid Adrian uses was enough to give him a clue that he was on the right track and the reason to proceed further with his work. The proteins of primates and humans are very similar so the effects of gorilla spinal fluid on humans may have some benefit, though, at best, it would only be temporary.

In the film the purpose of the spinal fluid was to cause growth of new nerve tissues that would repair damaged muscle coordination and allow paralyzed people to walk again. The gorilla was provided via an accident at a local circus and the animal's spinal serum was successful enough it gave Adrian the impetus to seek out human spinal fluid. In reality, what Adrian wanted was a protein hormone called nerve growth factor that would help stimulate nerve growth. In the search for nerve growth factor hormone this protein can be obtained from a number of cell types and tissues and not specifically from spinal fluid. Eventhough gorilla and human nerve growth factor is similar it would be cheaper and much easier if Adrian was able to make a synthetic version.

THE MAD MONSTER (1942)

growth hormone, testosterone

Mad scientist Dr. Lorenzo Cameron (George Zucco) has been thoroughly discredited by his academic colleagues. He uses 'wolf' serum as a "catalytic agent" to transform a man into a wolf, to create a werewolf. His goal is to build "an army of wolf men". A colleague comments on Cameron's work, "Your crazy experiments are a disgrace to science". In addition, a professor adds, "What good can come from tampering with the normal laws of nature?...mingling the blood of man and beast is downright sacrilege."

The serum injections Cameron gives his assistant, Petro (Glenn Strange) appear to be intravenous. In Cameron's lab we see a "wolf" in a cage (that looks suspiciously like a coyote) with a gauze around its left front leg simulating a blood transfusion procedure. 'Wolf' (i.e., coyote) blood was being drawn off into a glass container (with no concern about sterility). Cameron then mixes a small amount of the blood with another liquid (probably a buffer) and proceeds to inject this into his assistant, Petro, thereby rapidly transforming him into a werewolf. As such no full moon is required for the transformation. The facial changes brought about by the injection are a more pronounced brow, lengthening of hair, and longer teeth.

Also, hair appears on his hands. With such a rapid change then the hormonal effects were on tissue and muscle movements and not a more fundamental change at the genetic (DNA) level.

After the injection Cameron says, "He's no longer human...a wolf...my catalytic agent has brought about a complete transformation from man to wolf." When appraised of such results a colleague comments, "Foolish tampering with nature." Cameron later comments, "My new serum...I've perfected an antidote that induces the return of immediate normalcy". In this respect Cameron has a reagent that neutralizes the effects of the hormones brought about by the wolf serum.

By way of explanation Cameron says, "I've discovered a certain extremely volatile element in the blood that are more than electrical particles of energy. A source of all physical growth and mentality. By exciting the various glands and brain cells I've learned how to extract and concentrate these elements from the blood of various animals. I can control evolution. I've discovered the source of life." Though in way too many words what Cameron was saying is he found that hormones ("volatile element") can cause dramatic changes at the physical and mental levels. Unfortunately, wolf hormones will only work on fellow wolves and not on humans.

DR. RENAULT'S SECRET (1942)

Growth hormone, testosterone

Dr. Renault's precis is wanting to transform an ape into a human. He does this with a combination of surgery and hormonal therapy. What he essentially did not do was convert ape genes into human genes. If the transformation was done at the genetic level the changes would be permanent but since the changes were done at the cellular level, as most hormones do, then the changes would be temporary and after the hormone wore off then so would the effects. However, exceptions to this are those changes brought on by some forms of growth hormone resulting in an overall growth which can not be reversed.

Renault says to Noel, the ape-to-man creature he made, "For years I've worked to change your appearance, to make you talk." Noel responds, "Want to make me like man". By way of explanation Renault says, "Experiment in transmutation" in which he starts with an ape, mixes in some glandular injections, a little surgery here and there and voila, ape man (Noel). Renault says, "I have undertaken glandular injections and brain surgery...the nerve graft operations were a success. The electroencephalogram indicates that the brain traces are becoming more human each day...The speech in the left hemisphere is fully developed...I've proved my theory." Ultimately, Noel "reverted back to animal state"; ie, killing and took out Renault (is 'animal state' one of wanton killing? In the wild apes do not kill).

THE CORPSE VANISHES (1942)

estrogen

Dr. Lorenz (Bela Lugosi) uses extracts obtained from young women (brides) to bring about regenerated youth in his "70-80 year old" wife. To obtain these extracts Lorenz inserts a syringe needle behind the lower right ear into the neck (lower brain area?) of each victim and removes about 5cc fluid. Lorenz then adds the fluid to another flask and adds more liquid. From this he removes about 5cc and injects this into his "ugly" wife in the same lower right ear/neck spot area. Shortly afterwards she has her youthful beauty restored. The effects are only temporary and seem to last a few hours. Lorenz says of the girls he gets, "all of them must be young" implying virgins are best.

Dr. Foster, a colleague, says, "trying to find a cure for his (Lorenz) wife...although she has the appearance of a young woman her heart and arteries indicate that she is at least 70 to 80 years old." Foster further comments about Lorenz's work, "sustain his (Lorenz) wife in a youthful state." A female reporter comments, "scientists are finding out every day that glands and hormones have a lot to do with life and health." Foster adds, "Glands in our bodies help determine the condition of our teeth, the texture of our hair." Though odd examples of how hormones can work and not what most people would first think of they nevertheless are accurate.

THE APE MAN (1943)

Growth hormone, nerve growth factor

Dr. James Brewster (Bela Lugosi) has created an ape spinal fluid serum that when tried on himself transforms him into an ape-like creature. To describe how Brewster is transformed into an ape-like human (or a human-like ape) his colleague says, "Six months ago we made an astounding discovery. It was so far advanced from anything that's been done to date that Jim decided to be the guinea pig for this experiment himself. I tried to talk him out of it but you know how stubborn he is when he gets an idea in his head." Since it was never explained what this "astounding discovery" is we can only guess but since it involves "ape fluid injections" then what fluids (or glands) does he use? Most likely hormone related but could be serum, plasma, spinal fluids, seminal fluid extracts, etc. (this could be a long list), all of which do influence hormone production and activity. Also, is the ape fluid used alone or in combination with some other ingredient(s)? Since it is body fluid based then it means it is hormone based.

The morphological ape changes seen in Brewster are superficial and only those of outer appearance such as hunched shoulders to make his arms appear longer, hands bent at the knuckles, and excessive hair on his face, chest, and hands. All in all it made him look more chimpanzee like. Otherwise, he acts and talks like a human. All of this suggests temporary superficial changes and not the permanent changes implied in the film. The ape spinal fluid should work in a transient manner like a hormone so the effects would not be long-term but in the film it was suggested that the effects were permanent. Perhaps they needed to

wait longer for the effects of the ape fluid to wear off. For permanent changes to occur then the DNA of the organism must be changed which is something different than transient hormonal changes and something no spinal fluid can do.

During one exchange Brewster tells a colleague, "I must have human spinal fluid injected into me. It's my only chance. It's the only way to counteract the ape fluid injections". (It was never stated whether these counteractions would be permanent or temporary.) The injections are given in Brewster's lower back spine. The injection could actually be given anywhere and not necessarily the spine itself. If the human spinal fluid only works in a temporary manner then why isn't the originally used ape fluid also temporary? To keep a supply on hand Brewster has a medium-sized jar filled with about 300ml of "spinal fluid" and says he has enough for 6 injections (the sterility of that jar is very suspect) so therefore each injection would be 50ml, quite a large volume, especially if it has to be injected into the spine (ouch!). After injecting himself with the spinal fluids Brewster's ape-man slouch and monkey mannerisms were eliminated though his hairyness remained (why not shave?). One has to ask if this process of reverting back to human was a physical or a mental process?

CAPTIVE WILD WOMAN (1943)

estrogen

Famous endocrinologist, Dr. Sigmund Walters (John Carradine), is conducting experiments on gland transplants. After some failures in small animals Walters obtains a female gorilla, Cheela, from a circus and transplants human female glands into the gorilla transforming the primate into "Paula Dupree" (played by Aquanetta). Unfortunately, the gland transplant is temporary and Paula reverts back to Cheela.

Walters is portrayed as a famous gland expert. In his office at the Crestview Sanatorium, Beth Colman (Evelyn Ankers) reads from a (fictitious) medical journal, "Medicine and Surgery" (as noted on the cover, "published monthly"). Listed on the cover table of contents is an article, "Glands and their secretions" by Dr. Sigmund Walters, indicating to all that he is indeed a world expert on all things glandular. To further support this, Dorothy reads from the journal that Walters is the discoverer of (fictitious) "vitamin E2" that "determines physical characteristics of all forms of animal life..." If true it would be very potent material indeed (and probably DNA). While Dorothy and her sister are talking to Walters he comments, "most ailments are traceable to glandular disorders", though fairly broad nevertheless a reasonably accurate statement.

Later, Walters adds, "Its been proven beyond doubt that glands can transform physical matter into any size, shape, or appearance...we have here in this Sanatorium a rare case of a follicular cyst which induces the secretion of unusual amounts of the sex hormone." Then to his nurse, Walters says, "What's to prevent us from transfusing these glandular extractions from a human being into a higher type of animal?" (meaning a gorilla). The nurse's answer of "The

authorities!" goes unheeded. Walters wants to transform an ape into a human being. A follicular cyst is not that rare in women and can form when ovulation does not occur and an ovary follicle does not rupture upon ovulation but continues to grow thereby becoming a cyst. Some cyst follicles can grow to about 6cm (2-3 inches) in diameter and their eventual rupture can cause a sharp, severe pain on the side of the ovary where the cyst formed. Usually after a few months the cysts themselves disappear with no symptoms.

Walters arranges to have Cheela the circus gorilla ("she's almost human!" says her trainer) kidnapped (gorilla-napped?) and brought to his lab. To transform the gorilla into Paula Dupree, Walters transfuses some of the female donor's (Dorothy Colman, Beth's sister) blood and glands into the gorilla. In the film we see the gorilla's left hand transform into a female human hand, meaning the hair disappears, the fingers become less round, and the flesh tone lightens. Further blood from Dorothy was transfused into the gorilla completing the transformation into Paula Dupree. It is assumed that female glands (read: estrogen, the female hormone) are what caused the transformation into a human female. It should be noted that both gorillas and humans have the same estrogen hormone so it is unclear how such a common hormone could have transformed an ape into a human.

To further complete the transformation of the gorilla into the human Paula Dupree Walters must "transplant a cerebrum...a cerebrum is essential to the success of this experiment." Needless to say, in donating her cerebrum the human donor, Dorothy, would die. Walters comments to his nurse, "why should a single life be considered so important?...and she (Dorothy) will die in the advancement of science." The transplant itself, a human cerebrum transplanted into the cranium of a gorilla, was all done by Walters himself, a procedure that would ordinarily be done by a team of surgeons, but was done by Walters in a mere 2hrs and 40min. Even so, after the transformation the nurse says, "a human form with animal instincts", indicating even though Paula may look human the instincts are still those of a gorilla. Also, the gorilla's brain would have to be removed to accommodate the human cerebrum. The supposition is that a human brain would secrete human hormones thereby transforming an ape body into a human body. Stating the obvious, transplanting a human cerebrum into a gorilla would have no effect.

After the successful transplant Walters uses imprinting and hypnosis to have Paula control her hormonal instincts and do only what Walters commands. To test her humanity Walters lets Paula work at a circus. At the circus, Paula helps out with the lions and tigers act by using her 'gorilla senses' to control the animals. In helping out Paula falls in love with her trainer. Later, when the trainer and his fiancée hug and kiss Paula goes into a 'hormonal fit' that results in her transforming back into Cheela. As Walters comments, "One thing I hadn't counted on, a terrific emotion would destroy the new tissues in your gland growths...now I have to do it all over again...another brain transplant."

THE MONSTER MAKER (1944)

Growth hormone; acromegaly

Dr. Igor Markoff (J. Carroll Naish), is a “specialist in glandular disorders”. His anti-acromegaly formula, called X54, (“I’m making a new batch of X54 and it needs constant watching”) is at the center of this film. The primary victim (Ralph Morgan) reads a science journal while waiting to see Markoff. In simplicity itself the publication’s name is: THE JOURNAL, and on a specific page with the subheading, “Council on Pharmacy and Chemistry” is an article by Dr. Markoff titled, “Man is what his ductless glands make him”, followed by the (totally unrelated) text, “The hematocrit, hemoglobin and plasma protein values are relatively unchanged but the pulse rate is accelerated during the first forty-eight hours.”

To make his X54 formula, the serum Markoff perfected that cures acromegaly, he starts with, “that concentrate of the pituitary. Boil dry, turn off the burners, add some elixir, place in 4cc ampules, and refrigerate them. Watch it closely. See that it continues to boil, but very slowly.” All in all a common procedure.

Markoff keeps his acromegaly-inducing formula in a brown bottle, labeled, ‘A-5-B2’, at room temperature. This formula would have to contain human growth hormone. He removes about 2cc by syringe and injects this into the victim thereby ultimately giving him acromegaly (typically, it takes years for acromegaly to manifest itself so how does he make the disease develop so rapidly?). Regarding his work, Markoff says, “I have succeeded with X53 in arresting the disease acromegaly, but it will do no more than hold it in check. No change, neither progressive nor retrogressive. I have every reason to believe this new formula (X54) will be a complete cure of the disease. Think what it would mean to have the power to control a dread disease like acromegaly.”

A doctor colleague says, “Acromegaly. Glandular in origin. Activated by a defective pituitary...a progressive disease.” The victim says, “Markoff. You set yourself up as a Frankenstein and created a monster. I am that monster.” Interestingly, the cure is “a long and slow treatment” whereas getting the disease in the first place was very rapid.

Acromegaly, a glandular ailment, is a slow progression syndrome that occurs when the anterior pituitary gland produces excess growth hormone. Normally at puberty the production of growth hormone ceases but in those with acromegaly the hormone continues to be produced and most commonly affects adults in middle age. As a result of this condition flat bones such as the jaw, cheekbones, forehead, hands, and hip continue to grow throughout life resulting in a misshapen and sometimes severely disfigured body. Serious complications including premature death can occur if not properly treated. Since acromegaly is a slow progressing disease it is difficult to diagnose during its early stages and is often missed for many years. The actor, Rondo Hatton (THE CREEPER and

HOUSE OF HORRORS) was afflicted with this in real life which is why he looked like he did. The Rondo Awards are named in his honor.

MESA OF LOST WOMEN (1953)

Growth hormone, estrogens

Dr Aranya is an endocrine entomologist who uses the power of hormones to alter insects and humans. In one particular scene he uses extracts of hormones to make humans into spiders and spiders into humans. (Note: compare the giant spider in this film with the giant spider in the film, TARANTULA, in which a nutrient is used to make giant spiders whereas in MOLW hormones are used to make giant spiders; either way both get giant tarantulas.)

A voice over describes Aranya's work as, "strange women who do not die." In analyzing Aranya's work a visiting scientist, described as "the worlds foremost 'organo therapist'" says, "These (scientific) papers on the anterior lobe of the pituitary and the effects of the specific hormones on other living things" are of interest. Aranya, "I have isolated the growth hormone of the anterior pituitary, the specific substance which controls the growth pattern of human beings...what would the effect be if this hormone or a complete human pituitary being transferred to the body of another creature? Moderate success among the lesser animals and complete failure among birds. While experimenting among the hexapods I came upon the Seracedia (sp?) family. Tarantulas. The tarantulas began to yield amazing results. They began to grow as large as human beings...and then I reversed the process by transplanting the control substance back into the human body. Observe this girl. I call her Tarantolla. She has beauty and intelligence and still possesses the capacity and instincts of the giant spider...she has the indurability of the insect (!) and if her body became damaged, she would loose and arm or a leg, she would grow a new one." Quite a remarkable description.

The Family name for tarantulas is Theraphosidae and has about 900 different species, none of them named Seracedia so not sure where that name came from. Also, since spiders have 8 legs and not 6 they should be called "octopods" and not hexapods. Lastly, spiders are *not* insects, they are arachnids.

Regarding Aranya's lab, he has copious glassware indicating working on small organic molecules. An anatomical wall chart and cases of identified insects and arachnids are a nice touch. Lastly, he has one cheesy microscope that is inefficient; it only has one (!) lens (a len!?).

THE AMAZING COLOSSAL MAN (1957)

Growth hormone

Due to radiation poisoning Glen Manning's hormonal balance was thrown completely out of whack and his body began to grow again eventually reaching the height of 60 feet. For such massive and sustained growth to occur a constant supply of growth hormone, not to mention all the nutrients necessary for

such growth, would have to be produced. This means that Manning's pituitary gland was in hyperdrive with a constant stream of produced hormone that uniformly caused his body to grow to correct gigantic proportions. No acromegaly here.

Within the film the leading scientist, Dr. Linstrom, reasoned that if they could at least stop the production of growth hormone then they could also stop the growth. In trying to explain Manning's condition to his fiancée the doctor says, "the body is like a factory, continually producing new cells to replace the older cells, damaged cells, or destroyed cells. Now this happens in all the different parts of the body. Bone cells grow new bone cells, skin cells grow new skin cells and so forth throughout the body. New cells replacing the damaged ones...it is this delicately balanced process of new cells replacing dying cells or damaged cells that is causing the growth problem with Glen...For some unknown reason new cells are growing at an accelerated or speeded up rate while at the same time the old cells are refusing to die. This is what makes Glen grow. That's what made the new skin." In the film, Linstrom thought that sulfa hydal drugs could stop the growth but not reduce it, which in reality could do neither.

THE BEGINNING OF THE END (1957)

Plant hormones

This film is a rare example in the SF genre in which plant hormones play an interesting role. At the greenhouse of the US Department of Agriculture, Illinois Experimental Station, Dr. Wainwright shows his large tomatoes and strawberries to a reporter. Wainwright explained that radiation induced acceleration of plant growth hormones (which class of hormones?) With such large strawberries and tomatoes then the plant hormones would have to be constantly produced and be transported into the fruiting bodies to spur growth. Not mentioned is the large volume of water in these fruits which by their very nature would weigh many pounds and therefore cause their branches to bend and possibly break due to the excessive weight.

In explaining the large fruit Wainwright says, "This we hope is the future of the American farmer and for that matter all farmers everywhere." The reporter responds "Can you eat them?" Wainwright says, "No. Not yet. But we hope to develop one day a hybrid that can be eaten." Then the reporter asks, "How do they get so big?" Wainwright says, "Radiation causes photosynthesis, that is the growing process, that continues night and day. The radioisotopes act as a sort of artificial sun, a sun that never sets." The idea here is radioactive isotopes cause plant hormone production. Regarding the soil he uses Wainwright says, "That's plant food and essential minerals. It keeps the plants from burning themselves up. They have to be fed constantly. Actually, the fruit would grow much larger if we didn't limit the stimulation." Alas and alas, more fiction than science.

SHE-DEVIL (1957)

Pineal gland, estrogens

At the core of this film is the pineal gland and the physical and emotional changes brought about by a "serum" derived from a fruit fly (*Drosophila melanogaster*). Dr. Dan Scott says, "The cure of any disease or injury is essentially a process of adaptation." A colleague, Dr. Bach, replies, "You were proceeding under the theory that all living organisms possess the ability in more or less degree to heal themselves." Scott quickly adds, "By adapting themselves to any harmful change in their environment. A lizard for example when injured will shed a tail and grow a new one. A chameleon will change its color for self protection." Bach, says "And you hope to develop a cure all serum from insects since they are the most adaptable of all living organisms." Scott replies, "So, I have developed a serum from the most highly evolved and most adaptable of all insects. The fruitfly...I putrified the bodies, injected into cow, and produced the serum. After clarifying with albumin, evaporating in vacuo..." Therefore, the serum Scott developed is cow based and not human nor insect.

A patient, Kyra, had a life-ending lung infection, tuberculosis. A chest x-ray shows her left lung lobes to be very opaque meaning there was much fluid infiltration, typical of TB patients. Scott gives her a 10cc IV injection saying it will require "6 hours to take effect." After injection, there was no sign of a needle mark since it had "closed and healed simultaneously." Later, a leopard scratched her arm and the wounds quickly healed (in seconds). Neither the growth hormone nor the serum would act that quickly.

From the emotional stress of being caught Kyra changes her hair from black to blond to avoid capture. In the film, Kyra can change her hair back to black and then back to blond just by "thinking" about it. Bach later looks at her hair sample under a microscope and comments, "the pigmentation is undoubtedly natural", meaning no dye pigment. Scott says, "It could have been the serum that changed Kyra's hair. Bach comments, "Emotional disturbances cause glandular disturbances. They in turn produce physical changes. Maybe it wasn't the serum alone that changed her hair but the serum and some great emotional disturbance." Either way, all hormone based.

ALLIGATOR PEOPLE (1959)

Growth hormone

Dr. Mark Sinclair says, "Then you know something of the life processes of the higher and lower organisms. Species like ourselves with a highly developed nervous system, bodily functions are controlled principally by the brain and the nerves. But in creatures with a less complex nervous system development life processes are governed by chemical substances secreted by ductless glands and carried in the blood system." Joyce responds, "Like hormones." Sinclair continues, "Being a doctor I was tremendously impressed by the healing power of just one hormone, hydrocortisone. It occurred to me how much more potent this hormone would be in a simpler organism. One that depended upon that hormone to live. For example, there are some small lizards that when attacked detach their tails completely...There are one or two species that can replace an

entire limb if they lost just one...I wanted to extract this wonderful reptilian substance and use it to cure human injuries. I isolated a protein chemical from the anterior pituitary glands of...our common variety of alligator." (gator glands!) Volunteers (mangled from auto accidents, etc) were injected with this protein in an attempt to fix or repair human injuries. Sinclair says, "Symptoms are after effects. There was an additional secretion beside the healing hormone (growth hormone) that I didn't know about." Joyce says, "Your patients are turning into alligators." Reptiles are cold blooded so Sinclair noted that a sun lamp he uses quiets them. To stimulate the pituitary gland secretions Sinclair uses radiation therapy via a 30 sec exposure from a cobalt 60 source (note: the radioisotope, cobalt 60, produces gama radiation). The cobalt beam is aimed at a gator brain at a 45 degree angle. For the main protagonist, Paul Webster, his gator looks were confined to his face, neck, upper chest, and lower arms & hands (and seemingly no gator tail). Apparently, excessive radiation exposure activated gator genes and gator hormones making Paul more of an alligator man. Paul says, "Combining x-ray with gamma radiation from the cobalt 60 might cure me completely." Well, actually, no.

Hydrocortisone is the same substance as cortisol and is a steroid hormone made in the adrenal cortex and is released in response to stress. Its primary role is to increase blood glucose, suppress the immune system (supresses inflammation), and helps metabolism. A rise in cortisol levels can impact decision making and the more the stress the more cortisol is made. Cholesterol is a metabolic precursor of steroid hormones like testosterone, estrogen, and cortisol and is the main culprit in synthesizing cortisol.

It is amusing in one scene where Joyce sits (!!) on a wood crate with the obvious labels: "CAUTION Radioactive Material; Cobalt 60" and another label, "WARNING" and she completely ingnores the warnings.

GIANT GILA MONSTER (1959)

Growth hormone

Many myths, legends, and folklore surround the Southwest and for us scary readers that of the Gila monster and gi-ants (some think of them as THEM!) should be near the top of the list. In this film, the giant gila monster is made possible by radiation induced pituitary hormone production.

The sheriff says, "I've been talking to a zoologist and the gila monster's size is controlled like everything else by a sort of thyroid or pituitary gland. Sometimes a change in diet can throw the balance all out of whack. Either the cells break down too fast or build up too slow and this makes either runts or giants out of them." Then by way of explanation (from a report from Tanganyika) the sheriff says, "certain salts have been absorbed by the plants, eaten, and transferred to animals causing them to be giants." (why weren't the plants affected?)

The Gila monster (*Heloderma suspectum*) is the only venomous lizard native to the US. However, with the name "monster" as part of its label it has a tough reputation to live up to (or down). In reality, the Gila monster is a shy and slow moving nocturnal animal that still inhabits the Gila River valley in the Arizona and New Mexico regions. It is easy to identify with its bright pink, orange, or red markings against a jet-black bumpy or beaded skin. Among the legends surrounding this monster are it has foul or toxic breath and that its bite is fatal (which it is not). It does not have hollow fangs (like venomous snakes) but rather has grooves in its lower teeth that channel the venom. This is why the Gila monster bites down on its victims and this chewing action works the venom into the bite. Yes, its bite can be extremely painful but no known healthy person has been verifiably known to die from a Gila monster. An interesting side note is that Gila monster venom has been extensively studied and one particular component is being used to treat type 2 diabetes.

THE LEECH WOMAN (1959)

Pineal gland / estrogens

Dr. Paul Talbot, an endocrinologist, is in a dysfunctional marriage with an aging, alcoholic wife and journeys to Africa in search for a hormone that restores beauty and prevents/delays ageing. Talbot says, "Its worth millions if I could ever find a way to make them young again." Talbot gets a blood sample from old lady, makes a slide prep, and looks at the sample under the microscope and says, "Remarkable. Corpuscle count, blood pressure, teeth, all seem to indicate old age (woman is reportedly 152 years old!). Talbot says, "Nothing can reverse the ageing process." In his research Talbot wants to make women look younger, not be younger. The old woman says, "another substance mixed with nipae powder for it to work." To demonstrate she places a few pinches of the powder into a glass of water and drinks and she appears younger. Talbot says, "You're looking at the most powerful concentrate of hormone known. A hormone that retards ageing. A similar hormone was first discovered in insects 20-25 years ago. The common silk worm produces it." As the old woman explains, the powder comes from an orchid (pollen) only found in Africa that takes 5 years to prepare.

Nipae, a powder from an orchid, is the source of the actions of the anti-ageing formula. This powder formula has a two-fold effect of delaying ageing and returning to younger beauty. What is interesting is both male pineal gland fluid and female pineal gland fluid give the same results in restoring youth and beauty.

It is amusing how the pineal gland fluid was obtained from the unfortunate victims. This fluid was obtained by using a 1-2 inch long lance on a ring that was plunged into the lower neck area. It should be noted that the pineal gland is in the center of the brain about 4 inches deep so it is difficult to understand how pineal hormones were obtained in this manner. Talbot says, "Lanced pineal gland deep in the cerebellum." The pineal hormone fluid is mixed with the nipae and drank (meaning it is injected so digestive processes do not affect the

formula). To make the formula it was noted that "it takes a man's life to do it." June Talbot has her husband Paul killed and uses his pineal hormone to make her young again. The hormone effects are temporary and a native says to June, "Your youth will not last long. Enjoy it." Under stress June changes back into an older looking woman (older each time she reverts after the nipae wears off.) so the hormones released by stress makes her age.

ATOM AGE VAMPIRE (1963)

Growth hormone

Professor Levins develops a compound, "derma 28", which regenerates and rebuilds abnormal cells and tissues. The motivation behind this is Levins' desire to help those suffering from radiation-induced burns and tissue damage. As Levins says, "The destructive and degenerative effect of atomic explosions have driven scientists more than ever before into research involving methods and processes of regeneration, rebuilding abnormal or totally destroyed cells. After using all his supply Levins kills young women to get the "glands which produced derma 28." Most likely, these glands are the pituitary, hypothalamus, and possibly the adrenals. (In this film, a young female is interpreted as post-puberty and pre-menopausal where "glands" would be more potent.) Nevertheless, a key ingredient would be estrogen with the supposition that female hormones would be better at returning scarred tissue to normal tissue in females. All in all, the radiation scarred cells and tissues would be destroyed and replaced with new cells and tissues brought about by the hormones and this would take some time to occur.

CORRUPTION (1968)

Estrogen

The model girlfriend of physician, Sir John Rowan (Peter Cushing), was accidentally injured when a hot flood lamp fell on her face badly scaring her right cheek. Rowan's research on guinea pigs showed that "living tissue can be restored without the pain of continuous grafting." As mentioned above the pituitary gland is a small structure at the base of the brain which releases a wide variety of hormones that, in turn, controls the activity of the body's other hormone glands. The "pituitary gland" that Rowan removes at autopsy from a female auto victim is the size of a golf ball! As Rowan comments, "I've taken the pituitary. I believe I've discovered an entirely new way to control the endocrine system, to promote tissue growth." Rowan makes an extract of the female pituitary and injects about 2ml directly into the scar tissue on his girlfriend's cheek saying, "this contains the fluid that controls growth through the endocrine system." A colleague, Dr. Harris comments, "you used the pituitary and the hypothalamus from that dead girl. We don't know enough about the endocrine system yet." Rowan replies, "It worked. The secretion is functioning normally." Unfortunately, the scar tissue returned about 2 weeks later demonstrating the temporary nature of the hormone treatment. Rowan ended up killing an additional 3 more females to get their glands and hormones so he could continuously treat his girlfriend.

DARK ANGEL (aka, I COME IN PEACE; 1997)

endorphins

The name of the drug in this film is, "Blarcy", which is nothing more than a mixture of endorphins that for the aliens is a recreational drug. Endorphins ("*endogenous morphine*") are natural endogenous neuropeptides that have opioid-like effects. Endorphins are produced by the pituitary gland. Once released endorphins enter the spinal cord and brain for their effects. An older term is enkephalins. The so-called 'endorphin high' is a result of the body's natural response to excessive muscular movements often experienced by long-distance runners.

To obtain the drug an alien injects humans with a high dose of heroin which causes a massive release of endorphins that the alien extracts and subsequently uses as his drug. As an alien said, blarcy is "a priceless drug from where I'm from...rare, illegal." It was stated that "one ounce would be enough for 1000 doses." An ounce is 28.35 grams and dividing it by 1000 would make 28.35 milligrams per dose. A large dose for anyone that would more than achieve the 'high' sought after. The alien is essentially a drug dealer from outer space.

As a coroner states upon examining a victim of the alien, "heroin stimulates the pituitary to make endorphins. Endorphins are a hormone that create an incredible sense of well being. Nature's ecstasy." It is this 'high' that the alien wants and his way of getting it is to overdose humans. If that were me I would go to a pharmacy that sells endorphins or, better yet, order some through biochemical catalogs (its legal) and remain anonymous with the order.

Endorphins are, as the coroner states, "nature's ecstasy" so though normal in humans it is apparently a recreational drug for aliens. Natural drug compounds are "natural" to the endogenous species but can be highly reactive in another species, such as man. Many of the products harvested from plants are natural to the plant species but can have quite dramatic effects in different species such as man, heroin being a good example with opium being another. The natural product drug heroin is natural to poppy plants but has significant and highly addictive effects in humans. In the same way, endorphins (blarcy) are natural to humans but addictive to these aliens.

Conclusions

The films overall can be categorized by the types of hormones used: growth hormone, estrogen, testosterone, nerve growth factor, and endorphins. Each hormone is specific to what physiology is being regulated; growth hormone for size (gigantism); estrogen for youth and beauty; testosterone for virility and strength; nerve growth factor for brain effects; endorphins for euphoria. All in all only 5 different human hormones and one plant hormone are used in these SF films suggesting that the extensive list of possible hormonal effects has just barely been tapped.

Growth hormone used to alter appearance / Excessive growth hormone

DR JEKYLL & MR HYDE
ISLAND OF LOST SOULS
DR RENAULT'S SECRET
THE MONSTER MAKER
THE MAD MONSTER

Radiation induced gigantism via growth hormone from the pituitary

THE AMAZING COLOSSAL MAN
THE BEGINNING OF THE END
MESA OF LOST WOMEN
GIANT GILA MONSTER

NIGHT OF THE LEPUS (though not discussed in this article the film plot uses hormones to disrupt rabbit reproduction but, instead, created giant (and very hungry) rabbits.)

Pineal gland

SHE-DEVIL
THE LEECH WOMAN

Plant hormones

THE BEGINNING OF THE END

Making Women More Beautiful

There are many films about transforming female scar tissue back to original form and this is a selective list. Over a 25 year period (1942 to 1968) the same plot device of making a woman beautiful with hormones has continued to be mined.

THE CORPSE VANISHES (1942)
SHE-DEVIL
THE LEECH WOMAN
ATOM-AGE VAMPIRE
CORRUPTION (1968)

Summary

Hormones are the scariest of all biomolecules because in one way or another they control *all* of our body's responses, both good and bad. They do indeed determine everything. That being said, then virtually every SF film, not to mention many outside the genre (including Westerns, Romance, and certainly testosterone-filled Action films), has some sort of hormonal influence, either directly or indirectly. This means there are too many films in which hormones play a role so we have to be selective and those selected here are a good representative examples. The films discussed here historically begin during the gland phase of cinema (early 1930s) and progressed into the hormone phase which in essence is still with us. This early phase could be called the "hormone gland era" in SF cinema. Since then the world has moved from one of hormones, a transient control system, to a more fundamental control, namely that which controls all life,

namely DNA. And when you control DNA then you effectively control life and all its forms. In the 21st Century the plots have shifted away from hormones and directly to the source of life itself, DNA.

Thanks for reading. It's back to the lab for me. Stay healthy and eat right.