

# DIETARY SUPPLEMENTS AS A SOURCE OF ILLEGAL/DESIGNER DRUGS

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# Dietary Supplement

*“A dietary supplement is something that is taken by mouth, and only contains ingredients, who’s intention is only to supplement the diet”*



# Not Just US Problem



# Prohormones

- First introduced to the market in 1996
  - Androstenedione
  - 4-androstenediol, Norandrodiol, 1-Testosterone



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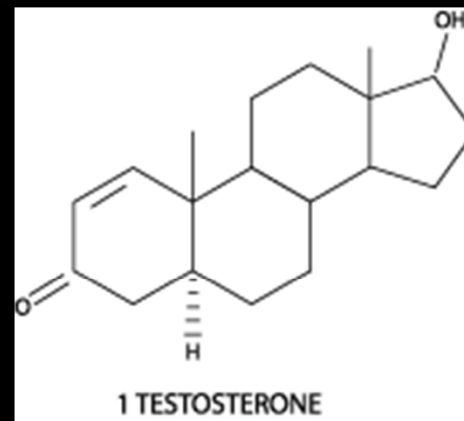
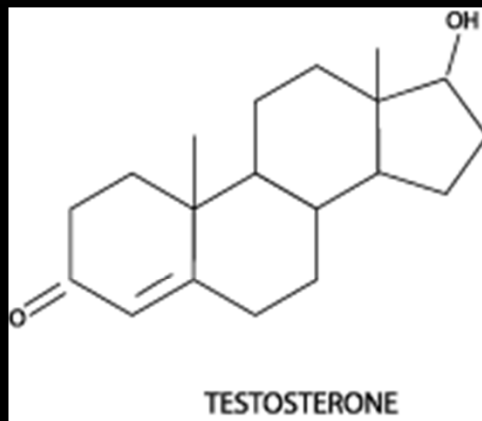


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# 1-Testosterone

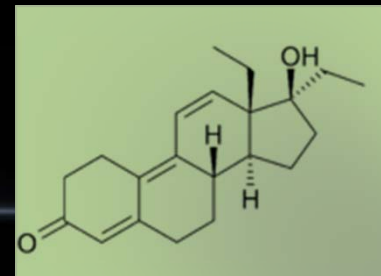


Move the double bond- 7 times anabolic as Testosterone



# BALCO

- Designer steroids, specifically designed, manufactured for athletes
- Norbolethone (“The Clear”)
  - Developed 1966 by Wyeth Laboratories
  - Never released, fears of toxicity
- Tetrahydrogestrinone (THG, “The Clear”)



# Steroids Hit “Supplements”

- Desoxymethyltestosterone (Madol, DMT)
  - 1961- invented, never marketed
  - 2005- Patrick Arnold, to market
  - 2010- scheduled CSA
- Methasterone (Superdrol)
  - 1956- Syntex Corporation, anti-tumor
  - 2005- marketed as Superdrol (Matt Cahill)



# Pills, Capsules and Powders

- Powerful and often dangerous
- Attempted to circumvent the US Anabolic Steroids Control Act of 1990
- Cult following
- Many instances of hepatotoxicity
- Almost 1 new product every month
- Methylstenbolone, methylclosterbol etc.



# Steroid “Supplements”

- Celtic Labs
  - Altered known steroids to circumvent DSHEA
    - Added 3-hydroxyimine instead of 3-keto
      - Methandienone, Mesterolone, Methy-1-Testosterone
- Patrick Arnold
  - Certifies ingredients from China, assists with synthesis



# Steroid “Supplements”

- Trenavar (Estra-4,9,11-triene-3,17-dione)
  - Prohormone to Trenbolone
- Methyltestosterone
- Turinabol
- Boldione
- 4-chloro-
- Methandienone
- Oxymetholone
- Dienolone



# Transdermal “Supplements”



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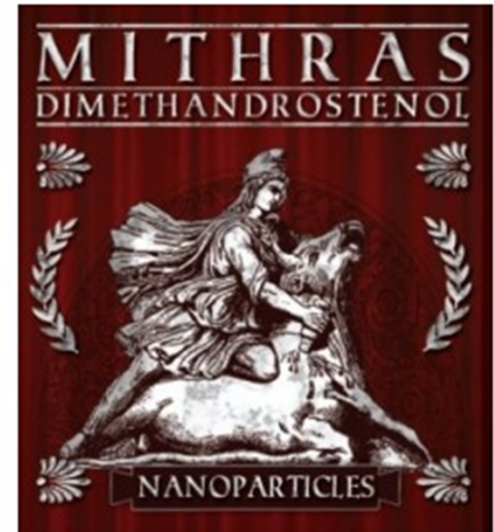
# Transdermal “Supplements”



# Oral, Liquid “Supplements”



# Back to Capsule “Supplements”



# Injectable “Supplements”



PureOils.net





# Stimulant “Supplements”

- Ephedra (ephedrine)
  - Traditional Chinese Medicine
  - Banned in 2004
  - 1000s adverse events, multiple deaths, Steve Belcher



# Stimulant “Supplements”

- Methylhexanamine (1,3,-dimethylpentylamine or DMAA)
  - Eli Lilly marketed as nasal decongestant
  - Brought to the supplement market, 2006
    - Geranium oil, extract etc.
  - Multiple deaths, athletes, military
  - FDA issues warning letters, 2013



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# Stimulant “Supplements”

- Craze
  - N, $\alpha$ -diethyl-phenylethylamine
    - Methamphetamine analog
    - Adverse events
    - Pulled from market



Matt Cahill

# Stimulant “Supplements”

- Oxilofrine (methysynephrine)



- Marketed as:
  - pre-workout enhancement
  - Well being and Mind enhancement

# Stimulant “Supplements”

- Carphedon
- Octopamine
- Amphetamine
- Methylphenethylamine
- Pseudoephedrine
- Sibutramine
- Modafinil
- Adrafinil
- DMBA (1,3,-dimethylbutylamine)



# Other “Supplements”

- Beta-2-agonists
- Diuretics
- Anti-estrogens (PA)
- IGF-1
  - Deer Antler Velvet



# Why Difficult to Regulate?

- No established list of dietary ingredients
  - Potentially infinite
- FDA can claim not a dietary ingredient
  - Legal challenges
  - Junk literature
    - Andro, DMAA
- FTC can cease for false advertising
  - No drug claims

