Heighten Science PUBLICATIONS Corporation

ISSN
2639-6777

Research Article

Pros and Cons Controversy on Molecular Imaging and Dynamics of Double-Standard DNA/RNA of Human Preserving Stem Cells-Binding Nano Molecules with Androgens/Anabolic Steroids (AAS) or Testosterone Derivatives through Tracking of Helium-4 Nucleus (Alpha Particle) Using Synchrotron Radiation

Alireza Heidari*

Faculty of Chemistry, California South University, 14731 Comet St. Irvine, CA 92604, USA

***Address for Correspondence:** Dr. Alireza Heidari, Faculty of Chemistry, California South University, 14731 Comet St. Irvine, CA 92604, USA, Email: Scholar.Researcher.Scientist@gmail.com; Alireza.Heidari@calsu.us

Submitted: 31 October 2017
Approved: 13 November 2017
Published: 15 November 2017

Keywords: Molecular Imaging; Molecular Dynamics; Double-Standard DNA/RNA; Stem Cells; Binding; Nano Molecules; Androgens/Anabolic Steroids (AAS); Testosterone Derivatives; Helium-4 Nucleus; Alpha Particle; Synchrotron Radiation; Nucleic Acids

Abstract

In the current study, we have investigated pros and cons controversy on molecular imaging and dynamics of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with Androgens/Anabolic Steroids (AAS) or Testosterone derivatives through tracking of Helium-4 nucleus (Alpha particle) using synchrotron radiation. In this regard, the enzymatic oxidation of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules by haem peroxidases (or heme peroxidases) such as Horseradish Peroxidase (HPR), Chloroperoxidase (CPO), Lactoperoxidase (LPO) and Lignin Peroxidase (LiP) is an important process from both the synthetic and mechanistic point of view.

Introduction

The enzymatic oxidation of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules by haem peroxidases (or heme peroxidases) such as Horseradish Peroxidase (HPR), Chloroperoxidase (CPO), Lactoperoxidase (LPO) and Lignin Peroxidase (LiP) is an important process from both the synthetic and mechanistic point of view [1-100]. Currently, molecular imaging and dynamics of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with Androgens/Anabolic Steroids (AAS) (Figure 1) or Testosterone derivatives (Figure 2) such as Testosterone [Androst-4-en-17β-ol-3-one], 4-Hydroxytestosterone [4-Hydroxytestosterone], 11-Ketotestosterone [11-Ketotestosterone], Boldenone [Δ^1-Testosterone], Clostebol [4-Chlorotestosterone], 4-Androstenediol [4-Androstenediol], 4-Dehydroepiandrosterone (4-DHEA) [4-Dehydroepiandrosterone], 5-Androstenedione [5-Androstenedione], 5-Dehydroandrosterone (5-DHA) [5-Dehydroandrosterone], 11β-Hydroxyandrostenedione (11β-OHA4) [11β-Hydroxy-4-androstenedione], Adrenosterone (11-ketoandrostenedione, 11-KA4) [11-Keto-4-androstenedione], Androstenediol (5-androstenediol, A5) [5-Androstenediol], Androstenedione (4-androstenedione, A4) [4-Androstenedione], Atamestane [1-Methyl-δ^1-4-androstenedione], Boldione (1,4-androstadienedione) [δ^1-4-Androstenedione], Dehydroepiandrosterone (DHEA, 5-DHEA; prasterone, androstenolone) [5-Dehydroepiandrosterone], Exemestane [6-Methylidene-δ^1-4-androstenedione], Formestane [4-Hydroxy-4-

How to cite this article: Heidari A. Pros and Cons Controversy on Molecular Imaging and Dynamics of Double-Standard DNA/RNA of Human Preserving Stem Cells-Binding Nano Molecules with Androgens/Anabolic Steroids (AAS) or Testosterone Derivatives through Tracking of Helium-4 Nucleus (Alpha Particle) Using Synchrotron Radiation. Arch Biotechnol Biomed. 2017; 1: 067-100. https://doi.org/10.29328/journal.hjb.1001007

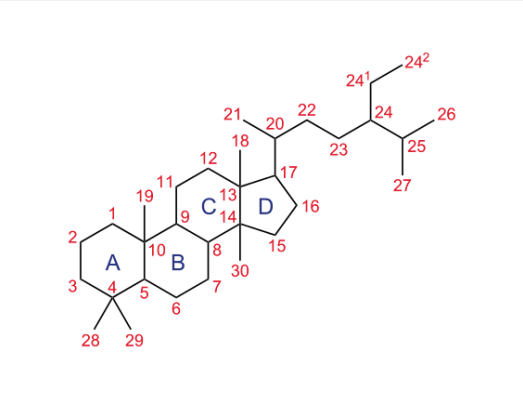


Figure 1: Molecular structure of Steroid ring system [1-297].

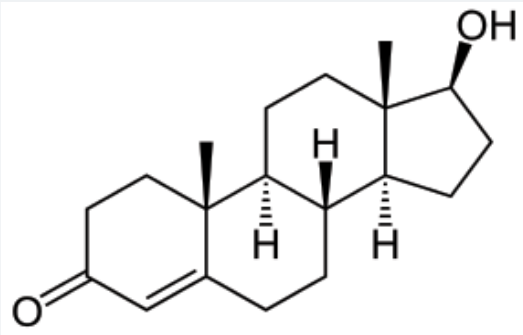


Figure 2: Molecular structure of Testosterone [Androst-4-en-17β-ol-3-one] [1-297].

androstenedione], Plomestane [10-Propargyl-4-androstenedione], Cloxotestosterone [Testosterone 17-chloral hemiacetal ether], Quinbolone [Δ^1-Testosterone 17β-cyclopentenyl enol ether], Silandrone [Testosterone 17β-trimethylsilyl ether], Dihydrotestosterone (DHT; androstanolone, stanolone) [4,5α-Dihydrotestosterone], 1-Testosterone (dihydro-1-testosterone, dihydroboldenone) [4,5α-Dihydro-δ^1-testosterone], 11-Ketodihydrotestosterone (11-KDHT) [11-Keto-4,5α-dihydrotestosterone], Drostanolone [2α-Methyl-4,5α-dihydrotestosterone], Epitiostanol (epithioandrostanol) [2α,3α-Epithio-3-deketo-4,5α-dihydrotestosterone], Mesterolone [1α-Methyl-4,5α-dihydrotestosterone], Metenolone (methenolone, methylandrostenolone) [1-Methyl-4,5α-dihydro-δ^1-testosterone], Nisterime [2α-Chloro-4,5α-dihydrotestosterone *O*-(*p*-nitrophenyl)oxime], Stenbolone [2-Methyl-4,5α-dihydro-δ^1-testosterone], 1-Androsterone (1-Andro, 1-DHEA) [1-Dehydroepiandrosterone], 1-Androstenediol (dihydro-1-androstenediol) [1-Androstenediol (4,5α-dihydro-δ^1-4-androstenediol)], 1-Androstenedione (dihydro-1-androstenedione) [1-Androstenedione (4,5α-dihydro-δ^1-4-androstenedione)], 5α-Androst-2-en-17-one [3-Deketo-2-androstenedione (3-deketo-4,5α-dihydro-δ^2-4-androstenedione)], Androsterone [Androsterone], Epiandrosterone [Epiandrosterone], Mepitiostane [2α,3α-Epithio-3-deketo-4,5α-dihydrotestosterone 17β-(1-methoxycyclopentane) ether], Mesabolone [4,5α-Dihydro-δ^1-testosterone 17β-(1-methoxycyclohexane) ether], Prostanozol [2,3-4(4',3'-Pyrazol)-3-deketo-4,5α-dihydrotestosterone 17β-tetrahydropyran ether], Bolazine (di(drostanolone) azine) [3,3-[(1E,2E)-1,2-Hydrazinediylidene]di(2α-methyl-5α-androstan-17β-ol)], Nandrolone (nortestosterone) [19-Nortestosterone], 11β-Methyl-19-nortestosterone (11β-MNT) [11β-Methyl-19-nortestosterone], Dienolone [19-Nor-δ^9-testosterone], Dimethandrolone [7α,11β-Dimethyl-19-nortestosterone], Norclostebol [4-Chloro-19-nortestosterone], Oxabolone [4-Hydroxy-19-nortestosterone], Trenbolone (trienolone) [19-Nor-$\delta^{9,11}$-testosterone], Trestolone (MENT) [7α-Methyl-19-nortestosterone], 7α-Methyl-19-nor-4-androstenedione (MENT dione, trestione) [7α-Methyl-19-nor-4-androstenedione], 19-Nor-5-androstenediol [19-Nor-5-androstene-

diol], 19-Nor-5-androstenedione [19-Nor-5-androstenedione], Bolandiol (nor-4-androstenediol) [19-Nor-4-androstenediol], Bolandione (nor-4-androstenedione) [19-Nor-4-androstenedione], Dienedione (nor-4,9-androstadienedione) [19-Nor-δ^{9}-4-androstenedione], Methoxydienone (methoxygonadiene) [18-Methyl-19-nor-$\delta^{2,5(10)}$-epiandrosterone 3-methyl ether], Bolmantalate (nandrolone adamantoate) [19-Nortestosterone 17β-adamantoate], Bolasterone [7α,17α-Dimethyltestosterone], Calusterone [7β,17α-Dimethyltestosterone], Chlorodehydromethyltestosterone (CDMT) [4-Chloro-17α-methyl-δ^{1}-testosterone], Enestebol [4-Hydroxy-17α-methyl-δ1-testosterone], Ethyltestosterone [17α-Ethyltestosterone], Fluoxymesterone [9α-Fluoro-11β-hydroxy-17α-methyltestosterone], Formebolone [2-Formyl-11α-hydroxy-17α-methyl-δ^{1}-testosterone], Hydroxystenozole [?,?(?,?-Pyrazol)-3-deketo-δ^{2}-testosterone], Metandienone (methandienone, methandrostenolone) [17α-Methyl-δ^{1}-testosterone], Methylclostebol (chloromethyltestosterone) [4-Chloro-17α-methyltestosterone], Methyltestosterone [17α-Methyltestosterone], Oxymesterone [4-Hydroxy-17α-methyltestosterone], Tiomesterone (thiomesterone) [1α,7α-Diacetylthio-17α-methyltestosterone], Chlorodehydromethylandrostenediol (CDMA) [4-Chloro-17α-methyl-δ^{1}-4-androstenediol], Chloromethylandrostenediol (CMA) [4-Chloro-17α-methyl-4-androstenediol], Methandriol (methylandrostenediol) [17α-Methyl-5-androstenediol], Methyltestosterone 3-hexyl ether [17α-Methyl-4-hydro-$\delta^{3,5}$-testosterone 3-hexyl ether], Penmesterol (penmestrol) [17α-Methyl-4-hydro-$\delta^{3,5}$-testosterone 3-cyclopentyl ether], Androisoxazole [2,3-Isoxazol-3-deketo-17α-methyl-4,5α-dihydrotestosterone], Desoxymethyltestosterone [3-Deketo-17α-methyl-4,5α-dihydro-δ2-testosterone], Furazabol [2,3-Furazan-3-deketo-17α-methyl-4,5α-dihydrotestosterone], Mestanolone (methyl-DHT) [17α-Methyl-4,5α-dihydrotestosterone], Methasterone (methyldrostanolone) [2α,17α-Dimethyl-4,5α-dihydrotestosterone], Methyl-1-testosterone (methyldihydro-1-testosterone) [17α-Methyl-4,5α-dihydro-δ^{1}-testosterone], Methylepitiostanol [2α,3α-Epithio-3-deketo-17α-methyl-4,5α-dihydrotestosterone], Methylstenbolone [2,17α-Dimethyl-4,5α-dihydro-δ^{1}-testosterone], Oxandrolone [2-Oxa-17α-methyl-4,5α-dihydrotestosterone], Oxymetholone [2-Hydroxymethylene-4,5α-dihydro-17α-methyltestosterone], Stanozolol [2,3-4(4',3'-Pyrazol)-3-deketo-17α-methyl-4,5α-dihydrotestosterone], Mebolazine (dimethazine, di(methasterone) azine) [3,3-[(1E,2E)-1,2-Hydrazinediylidene]di(2α,17α-dimethyl-5α-androstan-17β-ol)], Dimethyltrienolone (7α,17α-dimethyltrenbolone) [7α,17α-Dimethyl-19-nor-$\delta^{9,11}$-testosterone], Ethyldienolone [17α-Ethyl-19-nor-δ^{9}-testosterone], Ethylestrenol (ethylnandrol) [17α-Ethyl-3-deketo-19-nortestosterone], Methyldienolone [17α-Methyl-19-nor-δ^{9}-testosterone], Methylhydroxynandrolone (MOHN, MHN) [4-Hydroxy-17α-methyl-19-nortestosterone], Metribolone (methyltrienolone, R-1881) [17α-Methyl-19-nor-$\delta^{9,11}$-testosterone], Mibolerone [7α,17α-Dimethyl-19-nortestosterone], Norboletone [17α-Ethyl-18-methyl-19-nortestosterone], Norethandrolone (ethylnandrolone, ethylestrenolone) [17α-Ethyl-19-nortestosterone], Normethandrone (methylestrenolone, normethisterone) [17α-Methyl-19-nortestosterone], Tetrahydrogestrinone (THG) [17α-Ethyl-18-methyl-19-nor-δ9,11-testosterone], Bolenol (ethylnorandrostenol) [3-Deketo-17α-ethyl-19-nor-5-androstenediol], Propetandrol [17α-Ethyl-19-nortestosterone 3-propionate], Vinyltestosterone [17α-Ethenyltestosterone], Norvinisterone (vinylnortestosterone) [17α-Ethenyltestosterone], Ethisterone (ethinyltestosterone) [17α-Ethynyltestosterone], Danazol (2,3-isoxazolethisterone) [2,3-Isoxazol-17α-ethynyltestosterone], Norethisterone (norethindrone) [17α-Ethynyl-19-nortestosterone], Etynodiol (ethynodiol, 3β-hydroxynorethisterone) [17α-Ethynyl-3-deketo-3β-hydroxy-19-nortestosterone], Gestrinone (ethylnorgestrienone, R-2323) [17α-Ethynyl-18-methyl-19-nor-$\delta^{9,11}$-testosterone], Levonorgestrel ((−)-norgestrel) [(−)-17α-Ethynyl-18-methyl-19-nortestosterone], Lynestrenol (3-deketonorethisterone) [17α-Ethynyl-3-deketo-19-nortestosterone], Norgestrel (18-methylnorethisterone) [17α-Ethynyl-18-methyl-19-nortestosterone], Norgestrienone (ethynyltrenbolone) [17α-Ethynyl-19-nor-$\delta^{9,11}$-testosterone], Tibolone (7α-methylnoretynodrel) [7α-Methyl-17α-ethynyl-19-nor-δ5(10)-testosterone], Quingestanol [4-Hydro-19-nor-$\delta^{3,5}$-testosterone 3-cyclopentyl ether], Etynodiol diacetate (ethynodiol diacetate) [17α-Ethynyl-3-deketo-3β-hydroxy-19-

nortestosterone 3β,17β-diacetate], Norethisterone acetate (norethindrone acetate) [17α-Ethynyl-19-nortestosterone 17β-acetate], Norethisterone enanthate (norethindrone enanthate) [17α-Ethynyl-19-nortestosterone 17β-enanthate] and Quingestanol acetate [4-Hydro-17α-ethynyl-19-nor-$\delta^{3,5}$-testosterone 3-cyclopentyl ether 17β-acetate] (Figure 3), is receiving considerable interests [101-297]. In the current study, we have investigated pros and cons controversy on molecular imaging and dynamics of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with Androgens/Anabolic Steroids (AAS) or Testosterone derivatives through tracking of Helium-4 nucleus (Alpha particle) using synchrotron radiation.

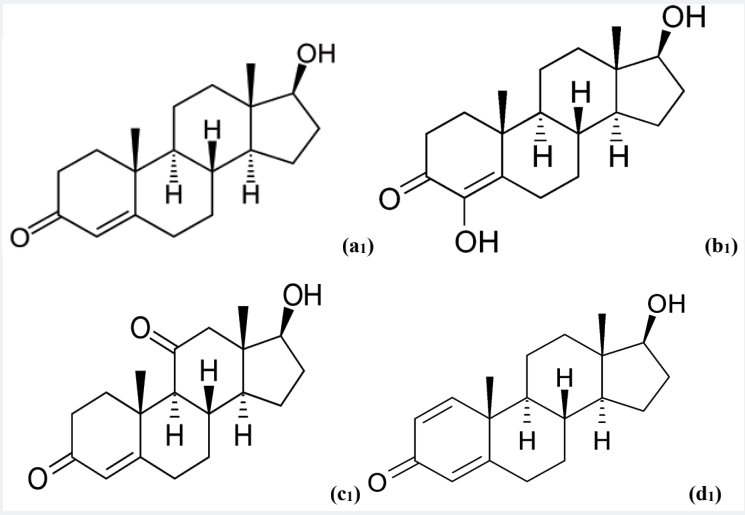


Figure 3: Molecular structure of Testosterone derivatives: (a1) 4-Hydroxytestosterone [4-Hydroxytestosterone], (b1) 11-Ketotestosterone [11-Ketotestosterone], (c1) Boldenone [Δ1-Testosterone], (d1) Clostebol [4-Chlorotestosterone].

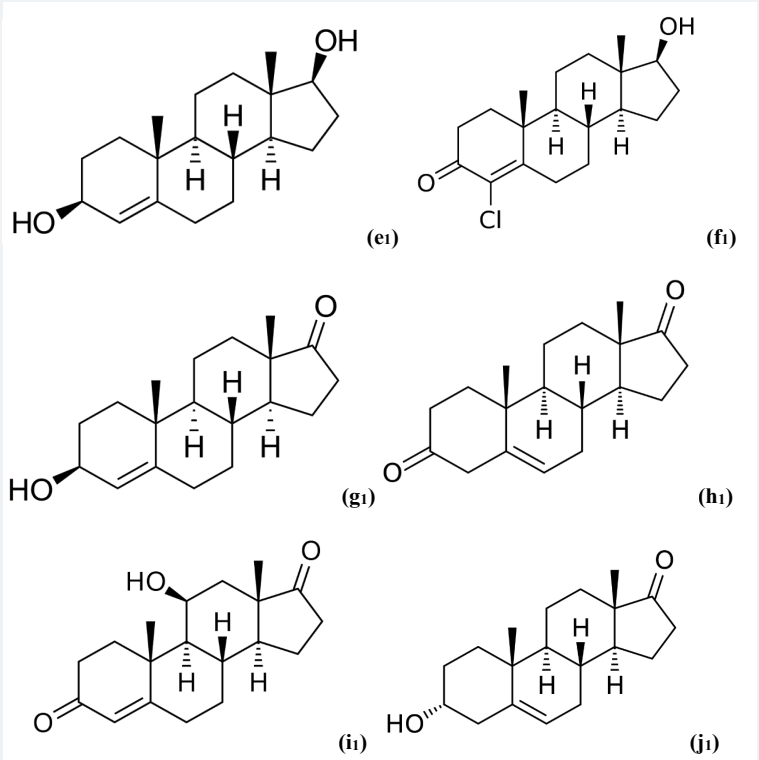


Figure 3: (e1) 4-Androstenediol [4-Androstenediol], (f1) 4-Dehydroepiandrosterone (4-DHEA), [4-Dehydroepiandrosterone], (g1) 5-Androstenedione [5-Androstenedione], (h1) 5-Dehydroandrosterone (5-DHA) [5-Dehydroandrosterone]. (i1) 11β-Hydroxyandrostenedione (11β-OHA4) [11β-Hydroxy-4-androstenedione], (j1) Adrenosterone (11-ketoandrostenedione, 11-KA4) [11-Keto-4-androstenedione].

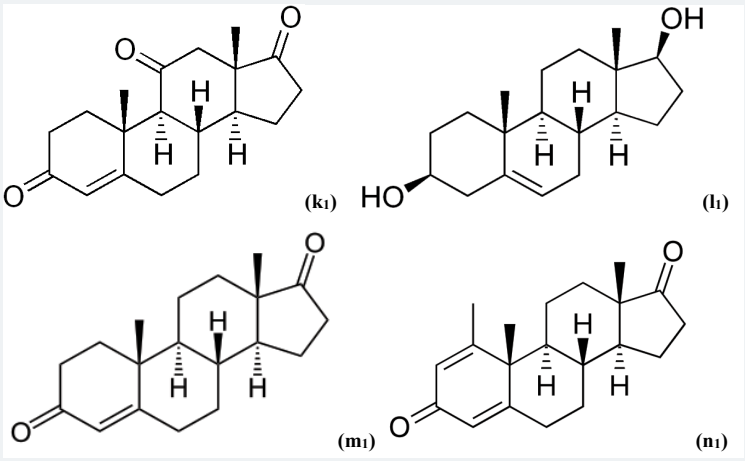


Figure 3: (k1) Androstenediol (5-androstenediol, A5) [5-Androstenediol], (l1) Androstenedione (4-androstenedione, A4) [4-Androstenedione], (m1) Atamestane [1-Methyl-δ1-4-androstenedione], (n1) Boldione (1,4-androstadienedione) [δ1-4-Androstenedione].

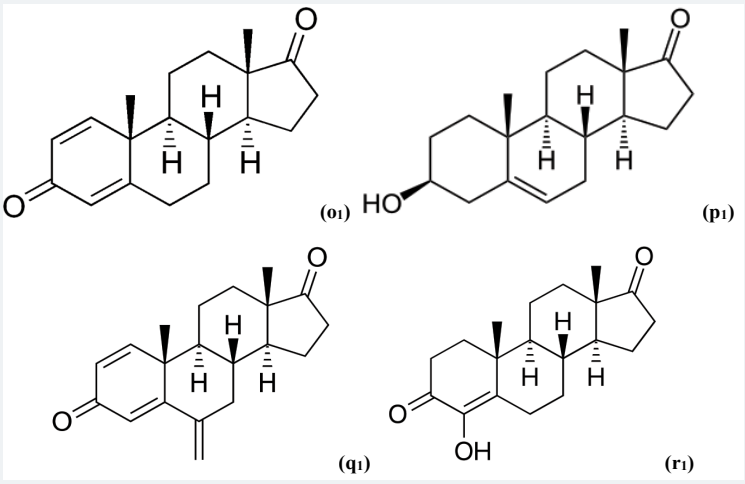


Figure 3: (o1) Dehydroepiandrosterone (DHEA, 5-DHEA; prasterone, androstenolone) [5-Dehydroepiandrosterone], (p1) Exemestane [6-Methylidene-δ1-4-androstenedione], (q1) Formestane [4-Hydroxy-4-androstenedione], (r1) Plomestane [10-Propargyl-4-androstenedione].

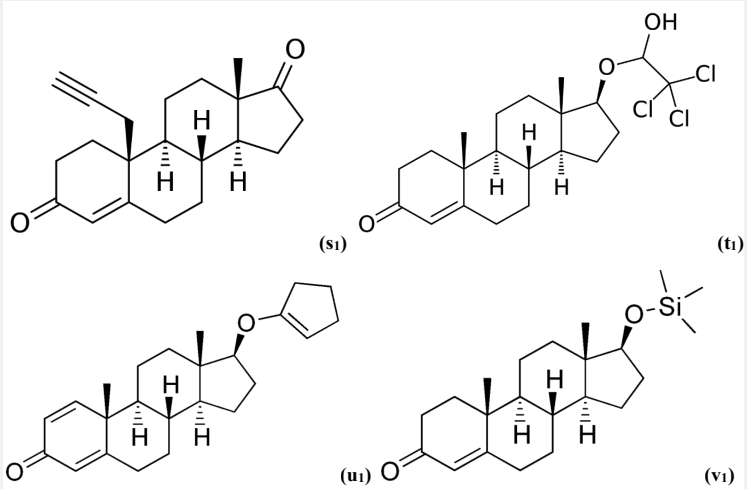


Figure 3: (s1) Cloxotestosterone [Testosterone 17-chloral hemiacetal ether], (t1) Quinbolone [Δ1-Testosterone 17β-cyclopentenyl enol ether], (u1) Silandrone [Testosterone 17β-trimethylsilyl ether], (v1) Dihydrotestosterone (DHT; androstanolone, stanolone) [4,5α-Dihydrotestosterone]

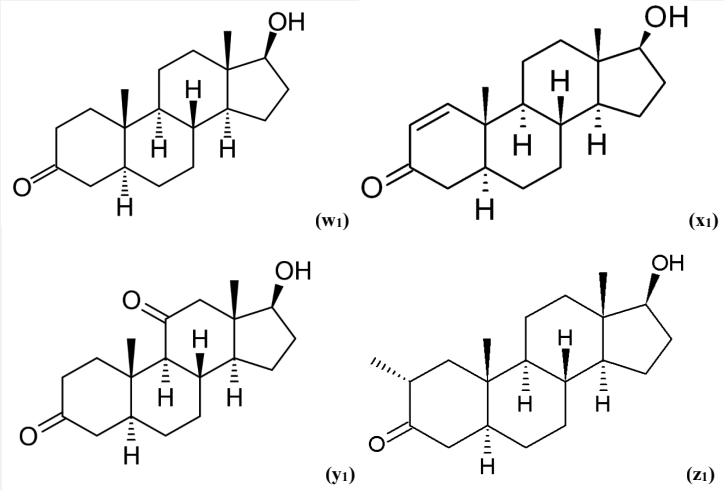


Figure 3: (w1) 1-Testosterone (dihydro-1-testosterone, dihydroboldenone) [4,5α-Dihydro-δ1-testosterone], (x1) 11-Ketodihydrotestosterone (11-KDHT) [11-Keto-4,5α-dihydrotestosterone], (y1) Drostanolone [2α-Methyl-4,5α-dihydrotestosterone], (z1) Epitiostanol (epithioandrostanol) [2α,3α-Epithio-3-deketo-4,5α-dihydrotestosterone].

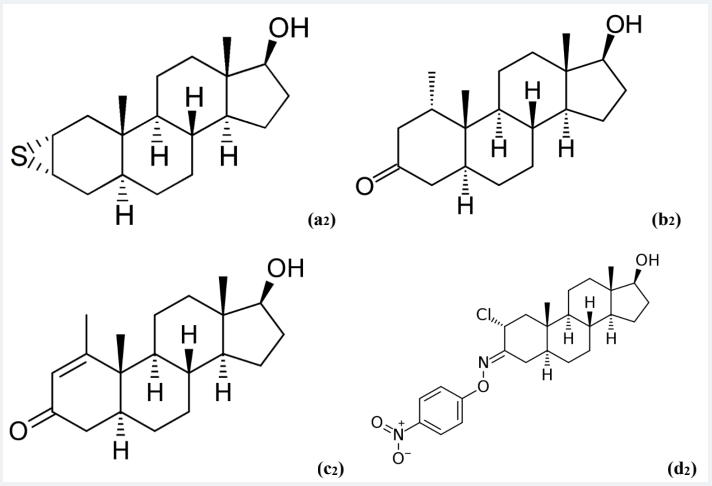


Figure 3: (a2) Mesterolone [1α-Methyl-4,5α-dihydrotestosterone], (b2) Metenolone (methenolone, methylandrostenolone) [1-Methyl-4,5α-dihydro-δ1-testosterone], (c2) Nisterime [2α-Chloro-4,5α-dihydrotestosterone O-(p-nitrophenyl)oxime], (d2) Stenbolone [2-Methyl-4,5α-dihydro-δ1-testosterone].

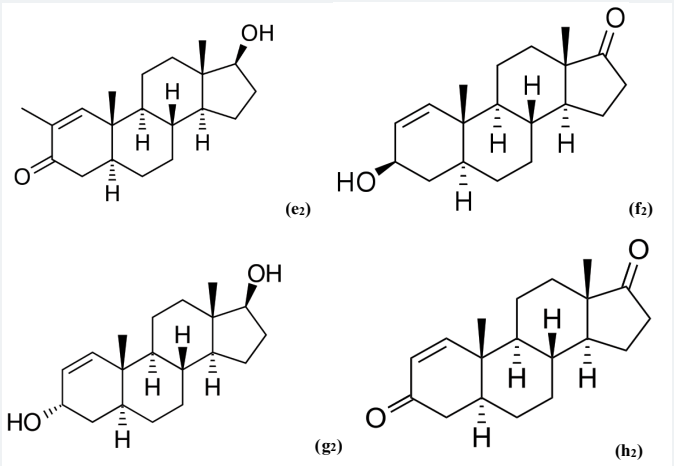


Figure 3: (e2) 1-Androsterone (1-Andro, 1-DHEA) [1-Dehydroepiandrosterone], (f2) 1-Androstenediol (dihydro-1-androstenediol) [1-Androstenediol (4,5α-dihydro-δ1-4-androstenediol)], (g2) 1-Androstenedione (dihydro-1-androstenedione) [1-Androstenedione (4,5α-dihydro-δ1-4-androstenedione)], (h2) 5α-Androst-2-en-17-one [3-Deketo-2-androstenedione (3-deketo-4,5α-dihydro-δ2-4-androstenedione)].

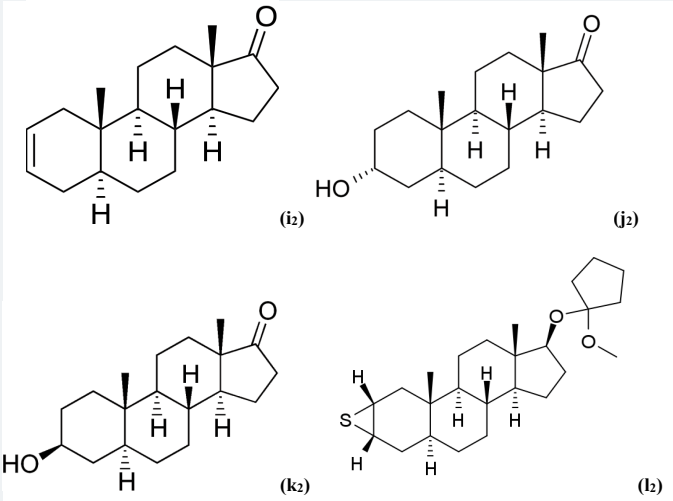


Figure 3: (i2) Androsterone [Androsterone], (j2) Epiandrosterone [Epiandrosterone], (k2) Mepitiostane [2α,3α-Epithio-3-deketo-4,5α-dihydrotestosterone 17β-(1-methoxycyclopentane) ether], (l2) Mesabolone [4,5α-Dihydro-δ1-testosterone 17β-(1-methoxycyclohexane) ether].

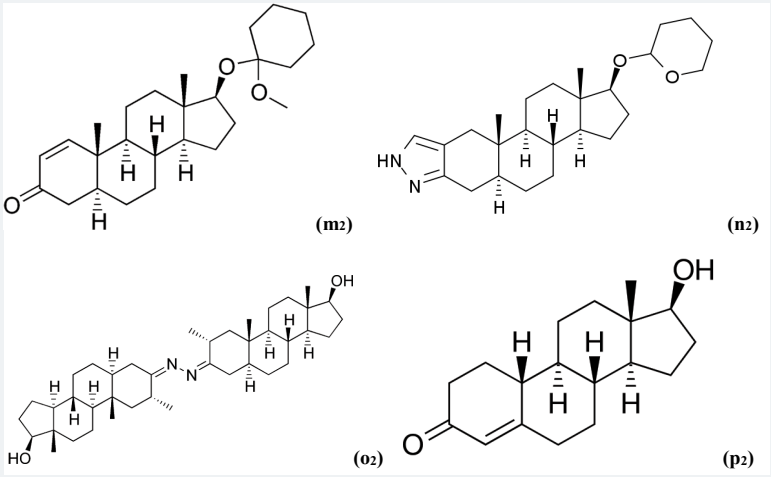


Figure 3: (m2) Prostanozol [2,3-4(4',3'-Pyrazol)-3-deketo-4,5α-dihydrotestosterone 17β-tetrahydropyran ether], (n2) Bolazine (di(drostanolone) azine) [3,3-[(1E,2E)-1,2-Hydrazinediylidene]di(2α-methyl-5α-androstan-17β-ol)], (o2) Nandrolone (nortestosterone) [19-Nortestosterone], (p2) 11β-Methyl-19-nortestosterone (11β-MNT) [11β-Methyl-19-nortestosterone].

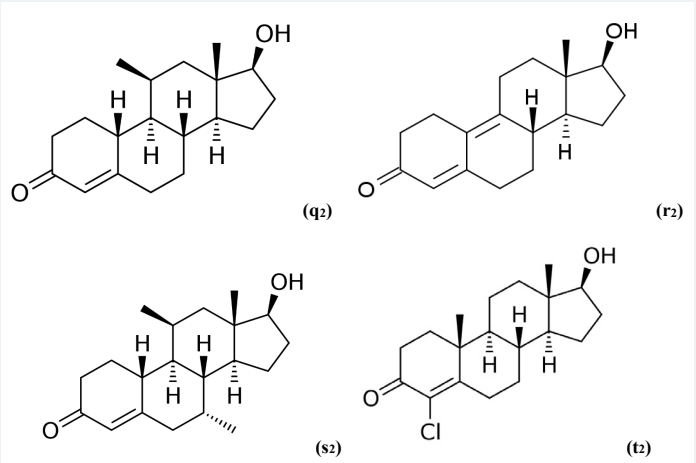


Figure 3: (q2) Dienolone [19-Nor-δ9-testosterone], (r2) Dimethandrolone [7α,11β-Dimethyl-19-nortestosterone], (s2) Norclostebol [4-Chloro-19-nortestosterone], (t2) Oxabolone [4-Hydroxy-19-nortestosterone].

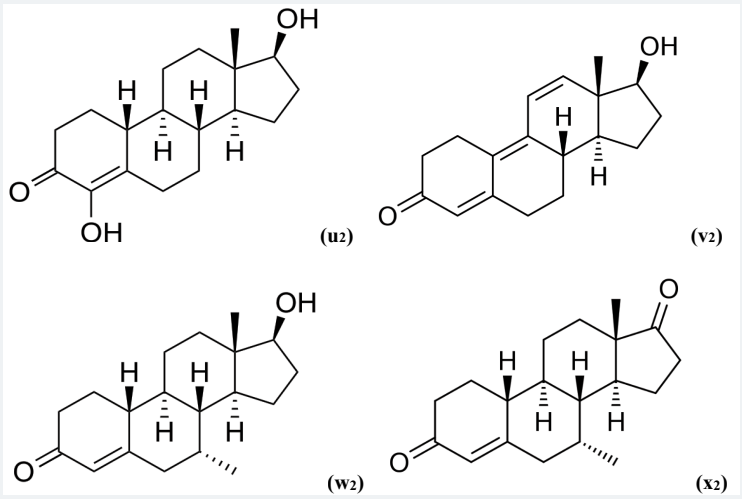


Figure 3: (u2) Trenbolone (trienolone) [19-Nor-δ9,11-testosterone], (v2) Trestolone (MENT) [7α-Methyl-19-nortestosterone], (w2) 7α-Methyl-19-nor-4-androstenedione (MENT dione, trestione) [7α-Methyl-19-nor-4-androstenedione], (x2) 19-Nor-5-androstenediol [19-Nor-5-androstenediol].

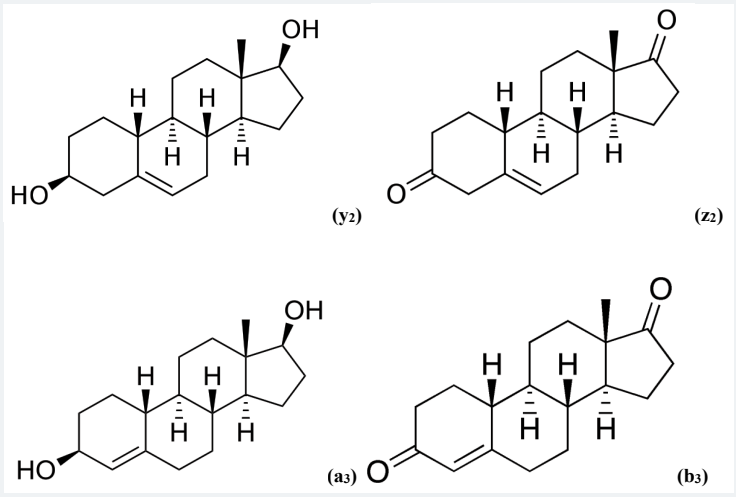


Figure 3: (y2) 19-Nor-5-androstenedione [19-Nor-5-androstenedione], (z2) Bolandiol (nor-4-androstenediol) [19-Nor-4-androstenediol], (a3) Bolandione (nor-4-androstenedione) [19-Nor-4-androstenedione], (b3) Dienedione (nor-4,9-androstadienedione) [19-Nor-δ9-4-androstenedione].

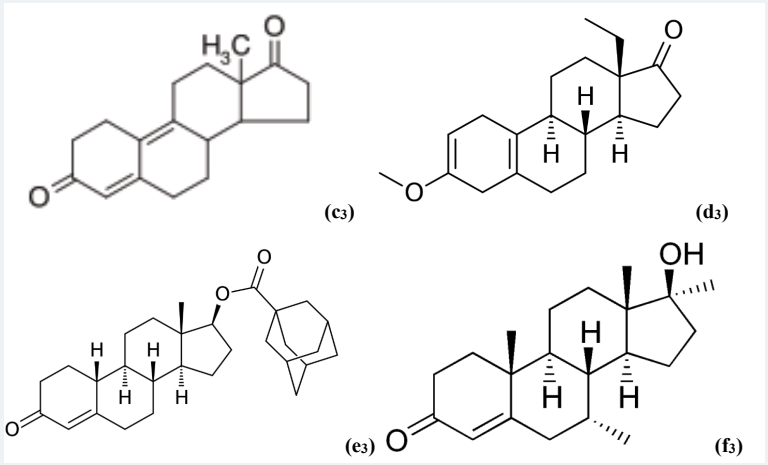


Figure 3: (c3) Methoxydienone (methoxygonadiene) [18-Methyl-19-nor-δ2,5(10)-epiandrosterone 3-methyl ether], (d3) Bolmantalate (nandrolone adamantoate) [19-Nortestosterone 17β-adamantoate], (e3) Bolasterone [7α,17α-Dimethyltestosterone], (f3) Calusterone [7β,17α-Dimethyltestosterone].

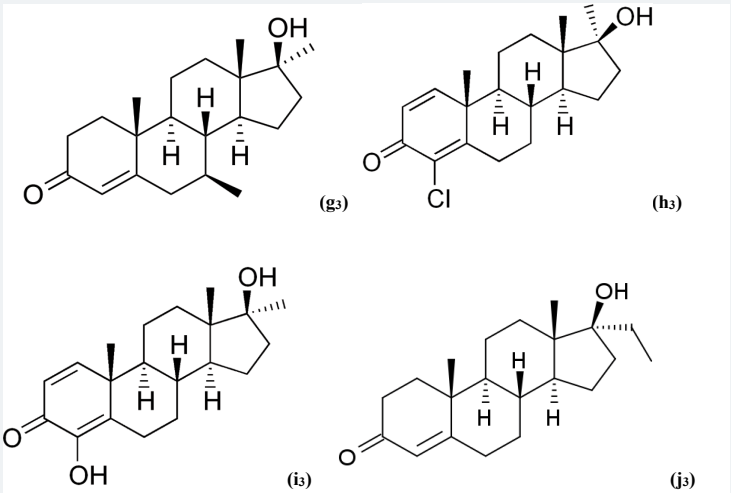


Figure 3: (g3) Chlorodehydromethyltestosterone (CDMT) [4-Chloro-17α-methyl-δ1-testosterone], (h3) Enestebol [4-Hydroxy-17α-methyl-δ1-testosterone], (i3) Ethyltestosterone [17α-Ethyltestosterone], (j3) Fluoxymesterone [9α-Fluoro-11β-hydroxy-17α-methyltestosterone].

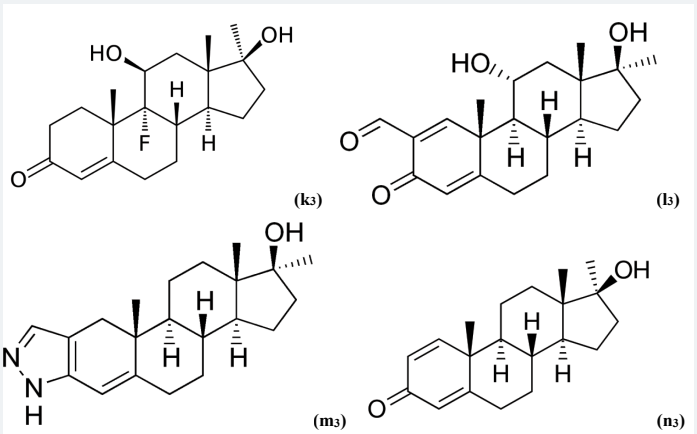


Figure 3: (k3) Formebolone [2-Formyl-11α-hydroxy-17α-methyl-δ1-testosterone], (l3) Hydroxystenozole [?,?(?,?-Pyrazol)-3-deketo-δ2-testosterone], (m3) Metandienone (methandienone, methandrostenolone) [17α-Methyl-δ1-testosterone], (n3) Methylclostebol (chloromethyltestosterone) [4-Chloro-17α-methyltestosterone].

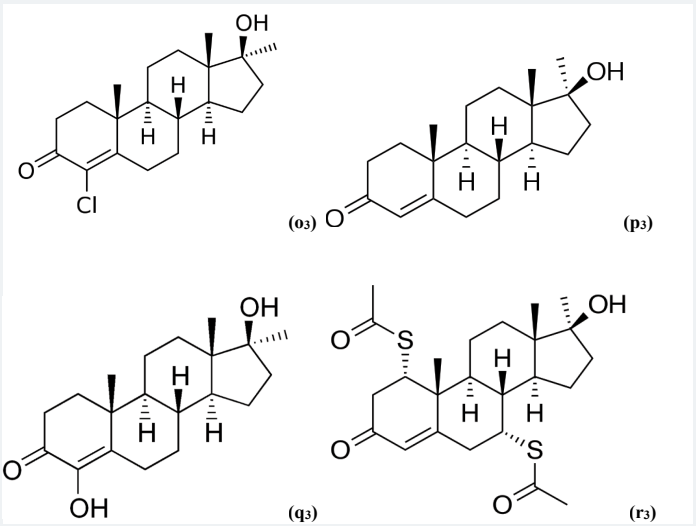


Figure 3: (o3) Methyltestosterone [17α-Methyltestosterone], (p3) Oxymesterone [4-Hydroxy-17α-methyltestosterone], (q3) Tiomesterone (thiomesterone) [1α,7α-Diacetylthio-17α-methyltestosterone], (r3) Chlorodehydromethylandrostenediol (CDMA) [4-Chloro-17α-methyl-δ1-4-androstenediol].

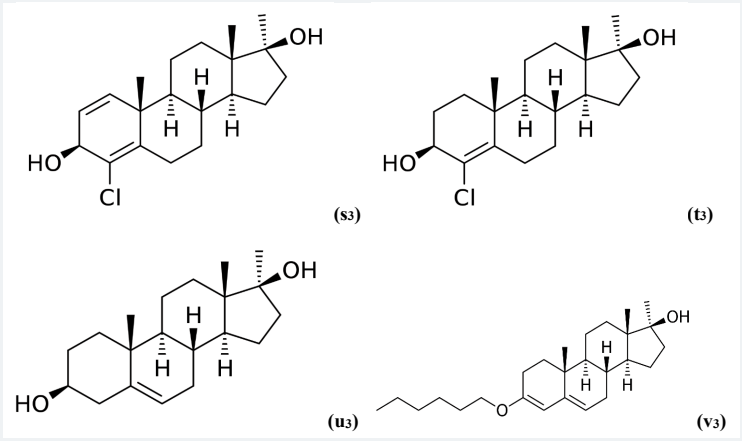


Figure 3: (s3) Chloromethylandrostenediol (CMA) [4-Chloro-17α-methyl-4-androstenediol], (t3) Methandriol (methylandrostenediol) [17α-Methyl-5-androstenediol], (u3) Methyltestosterone 3-hexyl ether [17α-Methyl-4-hydro-δ3,5-testosterone 3-hexyl ether], (v3) Penmesterol (penmestrol) [17α-Methyl-4-hydro-δ3,5-testosterone 3-cyclopentyl ether].

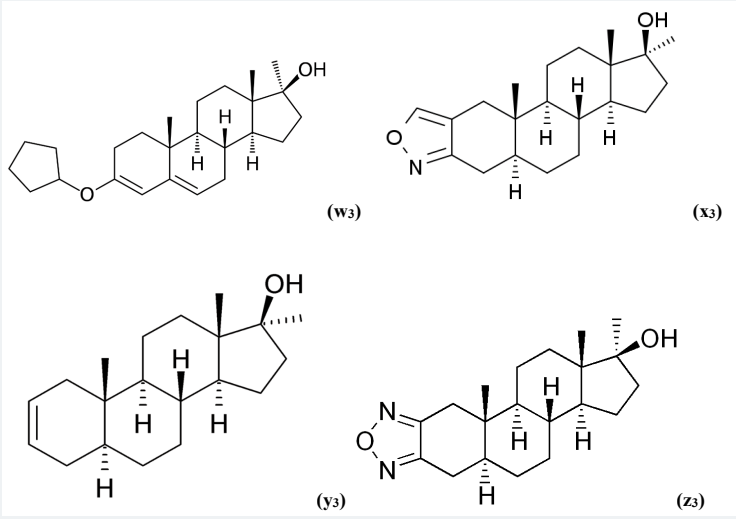


Figure 3: (w3) Androisoxazole [2,3-Isoxazol-3-deketo-17α-methyl-4,5α-dihydrotestosterone], (x3) Desoxymethyltestosterone [3-Deketo-17α-methyl-4,5α-dihydro-δ2-testosterone], (y3) Furazabol [2,3-Furazan-3-deketo-17α-methyl-4,5α-dihydrotestosterone], (z3) Mestanolone (methyl-DHT) [17α-Methyl-4,5α-dihydrotestosterone].

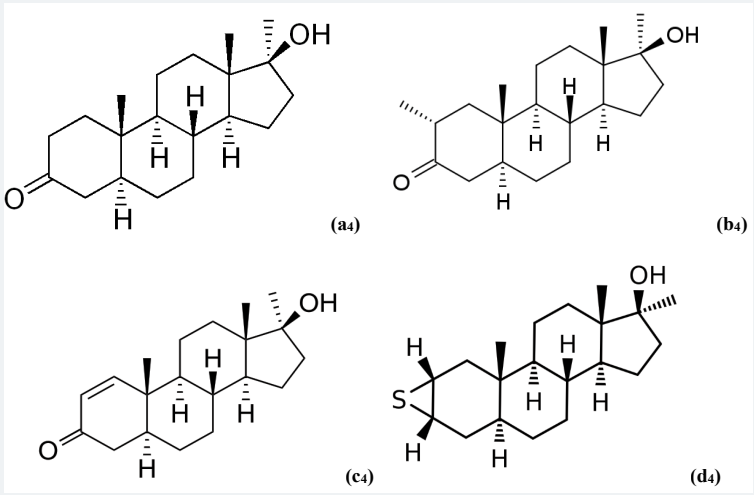


Figure 3: (a4) Methasterone (methyldrostanolone) [2α,17α-Dimethyl-4,5α-dihydrotestosterone], (b4) Methyl-1-testosterone (methyldihydro-1-testosterone) [17α-Methyl-4,5α-dihydro-δ1-testosterone], (c4) Methylepitiostanol [2α,3α-Epithio-3-deketo-17α-methyl-4,5α-dihydrotestosterone], (d4) Methylstenbolone [2,17α-Dimethyl-4,5α-dihydro-δ1-testosterone].

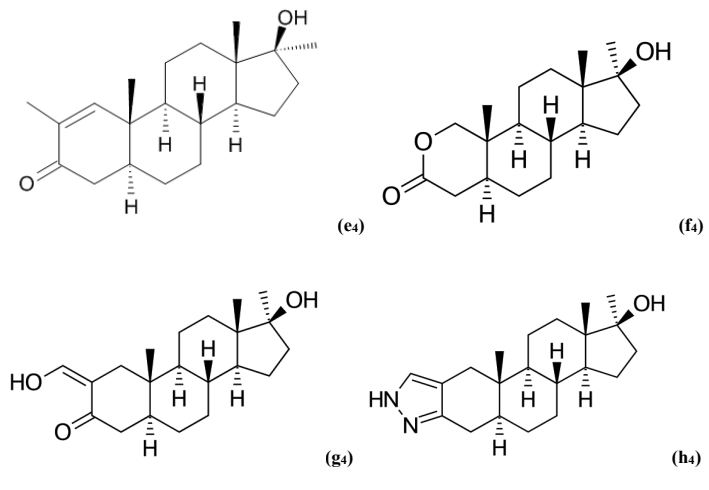


Figure 3: (e4) Oxandrolone [2-Oxa-17α-methyl-4,5α-dihydrotestosterone], (f4) Oxymetholone [2-Hydroxymethylene-4,5α-dihydro-17α-methyltestosterone], (g4) Stanozolol [2,3-4(4',3'-Pyrazol)-3-deketo-17α-methyl-4,5α-dihydrotestosterone], (h4) Mebolazine (dimethazine, di(methasterone) azine) [3,3-[(1E,2E)-1,2-Hydrazinediylidene]di(2α,17α-dimethyl-5α-androstan-17β-ol)].

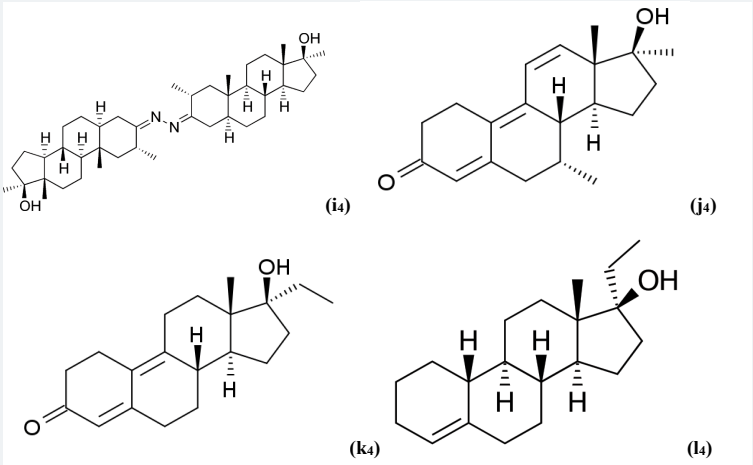


Figure 3: (i4) Dimethyltrienolone (7α,17α-dimethyltrenbolone) [7α,17α-Dimethyl-19-nor-δ9,11-testosterone], (j4) Ethyldienolone [17α-Ethyl-19-nor-δ9-testosterone], (k4) Ethylestrenol (ethylnandrol) [17α-Ethyl-3-deketo-19-nortestosterone], (l4) Methyldienolone [17α-Methyl-19-nor-δ9-testosterone].

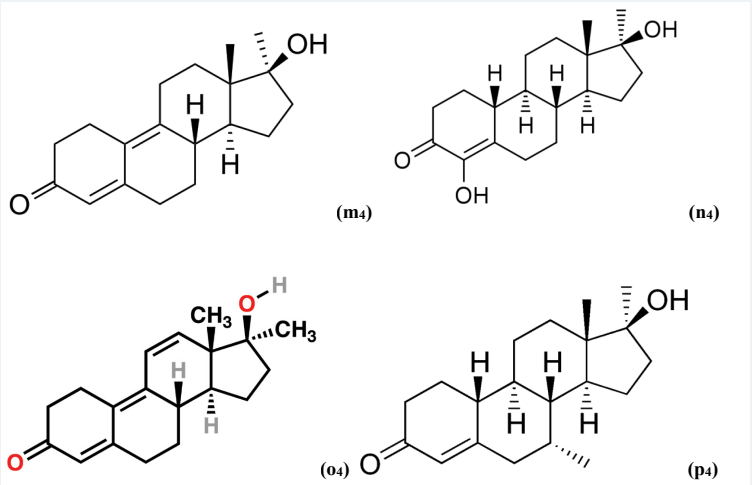


Figure 3: (m4) Methylhydroxynandrolone (MOHN, MHN) [4-Hydroxy-17α-methyl-19-nortestosterone], (n4) Metribolone (methyltrienolone, R-1881) [17α-Methyl-19-nor-δ9,11-testosterone], (o4) Mibolerone [7α,17α-Dimethyl-19-nortestosterone], (p4) Norboletone [17α-Ethyl-18-methyl-19-nortestosterone].

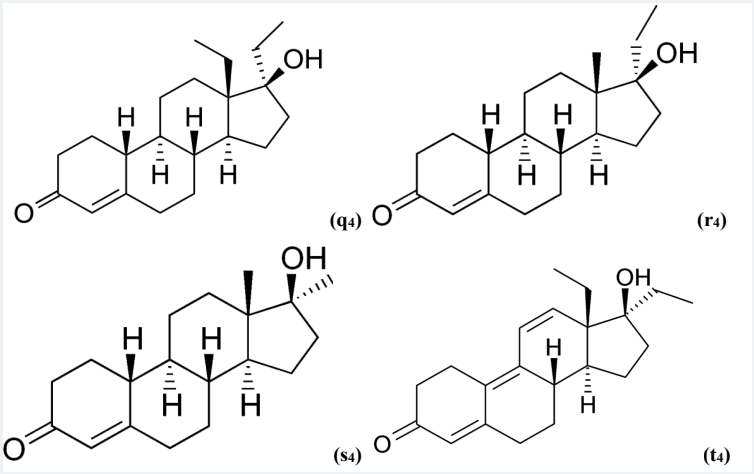


Figure 3: (q4) Norethandrolone (ethylnandrolone, ethylestrenolone) [17α-Ethyl-19-nortestosterone], (r4) Normethandrone (methylestrenolone, normethisterone) [17α-Methyl-19-nortestosterone], (s4) Tetrahydrogestrinone (THG) [17α-Ethyl-18-methyl-19-nor-δ9,11-testosterone], (t4) Bolenol (ethylnorandrostenol) [3-Deketo-17α-ethyl-19-nor-5-androstenediol].

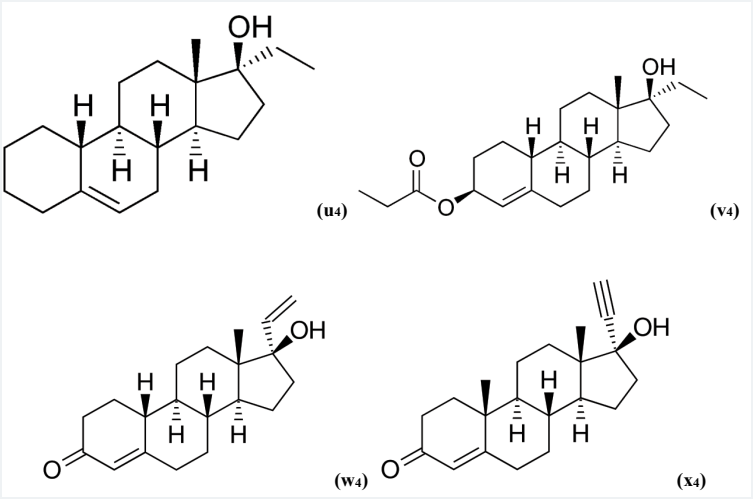


Figure 3: (u4) Propetandrol [17α-Ethyl-19-nortestosterone 3-propionate], (v4) Vinyltestosterone [17α-Ethenyltestosterone], (w4) Norvinisterone (vinylnortestosterone) [17α-Ethenyltestosterone], (x4) Ethisterone (ethinyltestosterone) [17α-Ethynyltestosterone].

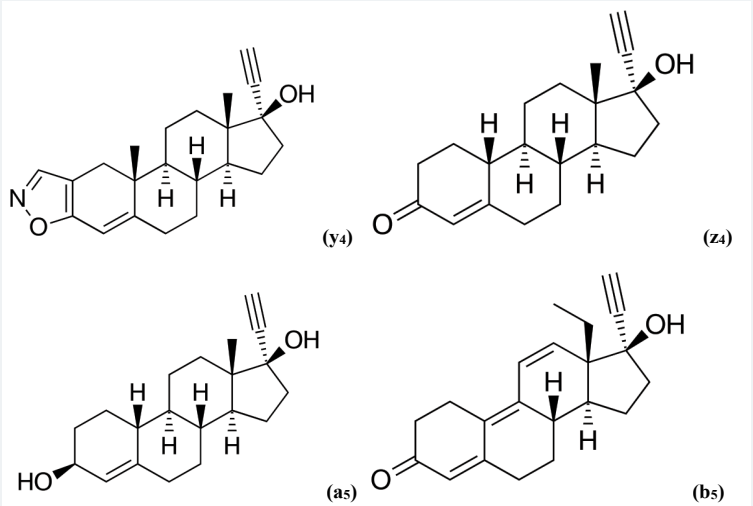


Figure 3: (y4) Danazol (2,3-isoxazolethisterone) [2,3-Isoxazol-17α-ethynyltestosterone], (z4) Norethisterone (norethindrone) [17α-Ethynyl-19-nortestosterone], (a5) Etynodiol (ethynodiol, 3β-hydroxynorethisterone) [17α-Ethynyl-3-deketo-3β-hydroxy-19-nortestosterone], (b5) Gestrinone (ethylnorgestrienone, R-2323) [17α-Ethynyl-18-methyl-19-nor-δ9,11-testosterone].

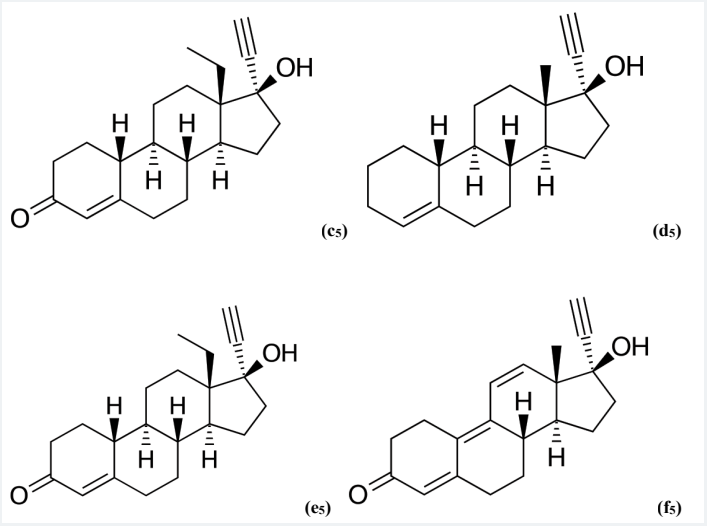


Figure 3: (c5) Levonorgestrel ((−)-norgestrel) [(−)-17α-Ethynyl-18-methyl-19-nortestosterone], (d5) Lynestrenol (3-deketonorethisterone) [17α-Ethynyl-3-deketo-19-nortestosterone], (e5) Norgestrel (18-methylnorethisterone) [17α-Ethynyl-18-methyl-19-nortestosterone], (f5) Norgestrienone (ethynyltrenbolone) [17α-Ethynyl-19-nor-δ9,11-testosterone].

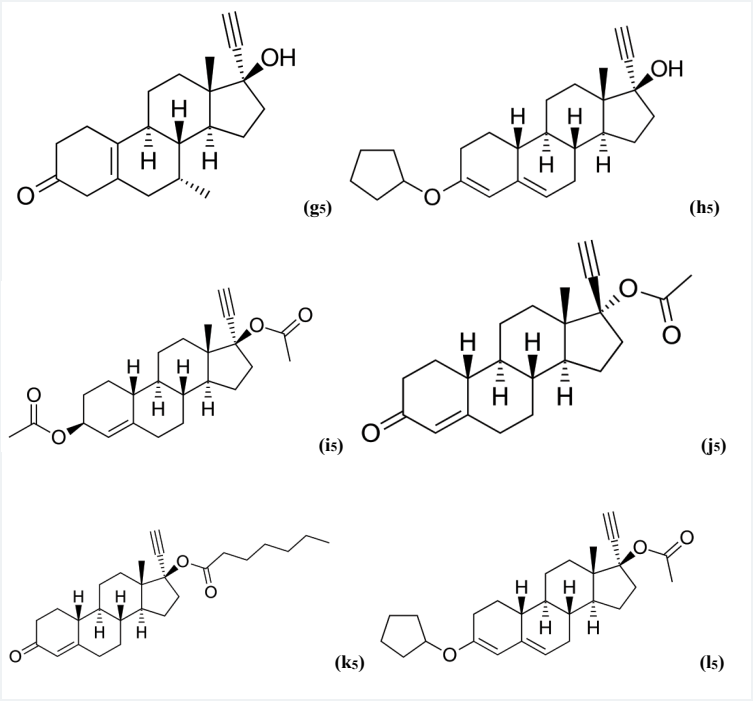
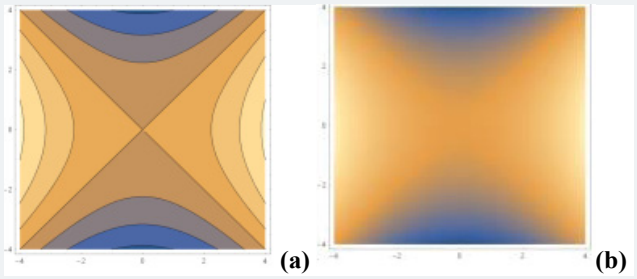


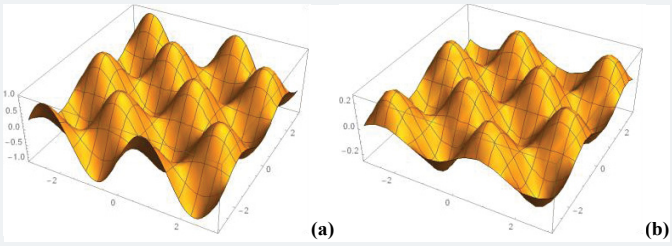
Figure 3: (g5) Tibolone (7α-methylnoretynodrel) [7α-Methyl-17α-ethynyl-19-nor-δ5(10)-testosterone], (h5) Quingestanol [4-Hydro-19-nor-δ3,5-testosterone 3-cyclopentyl ether], (i5) Etynodiol diacetate (ethynodiol diacetate) [17α-Ethynyl-3-deketo-3β-hydroxy-19-nortestosterone 3β,17β-diacetate], (j5) Norethisterone acetate (norethindrone acetate) [17α-Ethynyl-19-nortestosterone 17β-acetate], (k5) Norethisterone enanthate (norethindrone enanthate) [17α-Ethynyl-19-nortestosterone 17β-enanthate] and (l5) Quingestanol acetate [4-Hydro-17α-ethynyl-19-nor-δ3,5-testosterone 3-cyclopentyl ether 17β-acetate] [1-297].

It should be noted that we have used different light sources as sunchrotron radiation in the current study which include:

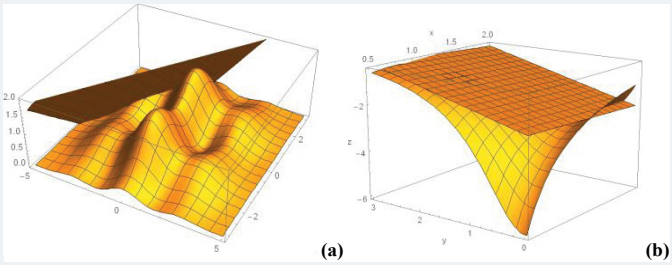
Electric discharge such as Electric arc, Arc lamp, Flashtube, Electrostatic discharge, Lightning, Electric spark, Gas discharge lamp, Electrodeless lamp, Excimer lamp, Fluorescent lamp, Compact fluorescent lamp, Tanning lamp, Black lights, Geissler tube, Moore tube, Ruhmkorff lamp, High-intensity discharge lamp, Carbon arc lamp, Ceramic discharge metal-halide lamp, Hydrargyrum medium-arc iodide lamp, Mercury-vapor lamp, Metal-halide lamp, Sodium-vapor lamp, Sulfur lamp, Xenon arc lamp, Hollow-



Graphical Figures: Different high-resolution simulations of molecular imaging and dynamics of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with Androgens/Anabolic Steroids (AAS) or testosterone derivatives through tracking of Helium-4 nucleus (Alpha particle) (a) before and (b) after irradiating of synchrotron radiation in transformation process to benign human cancer cells and tissues using different nanomaterials analysis techniques and methods with the passing of time [1-297].



Graphical Figures:



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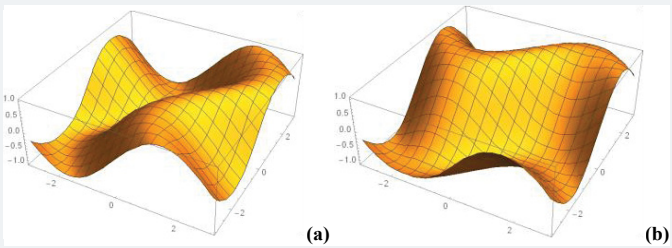

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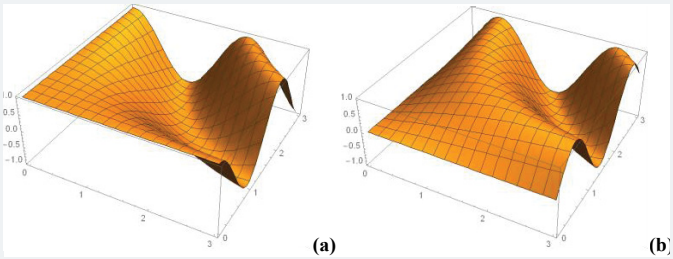

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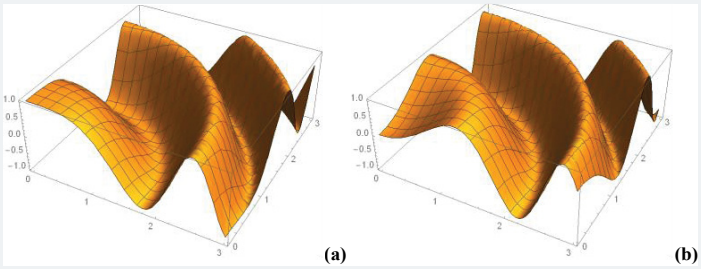

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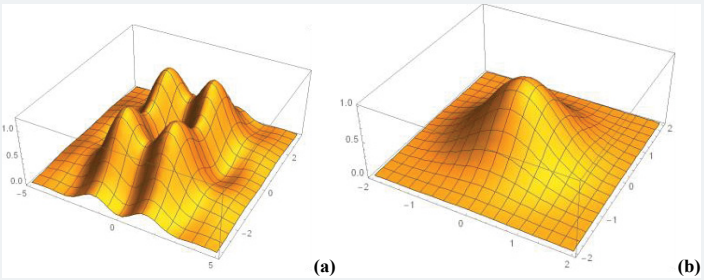

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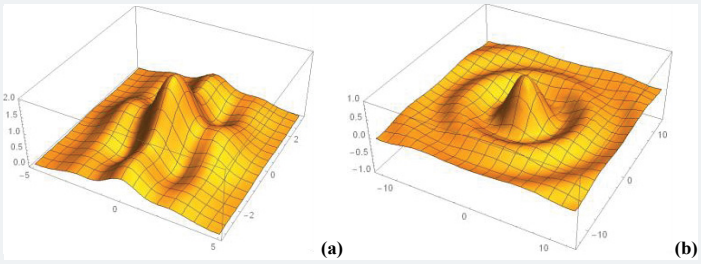

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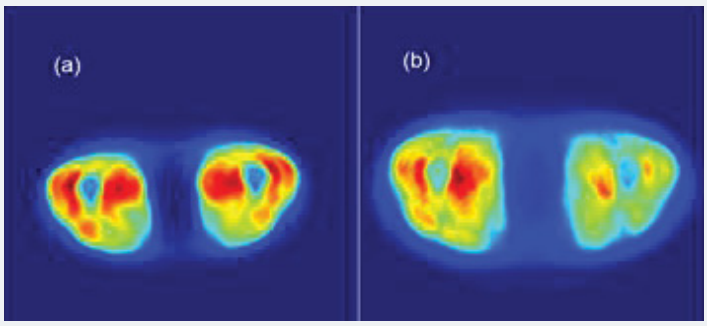

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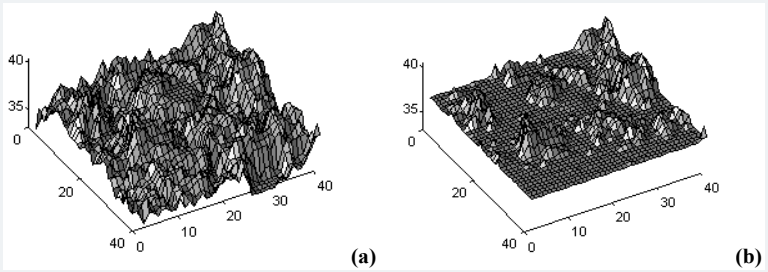

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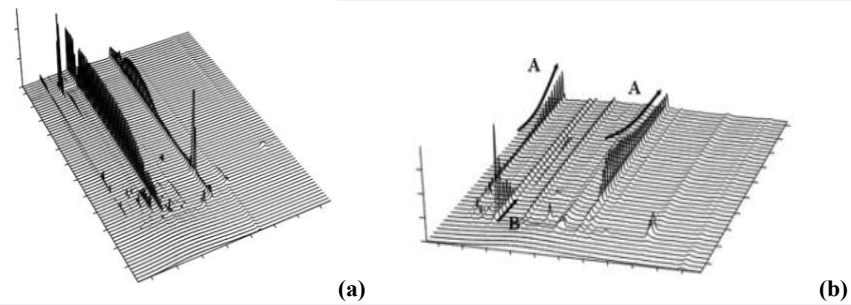

Graphical Figures:

cathode lamp, Induction lighting, Sulfur lamp, Neon and argon lamps, Dekatron, Nixie tube, Plasma lamp and Xenon flash lamp. Incandescence such as Black-body radiation, Carbon button lamp, Earthquake light, Halogen lamp, Incandescent light bulb, Lava, Nernst lamp, Volcanic eruption, Combustion, Argand lamp, Argon flash, Carbide lamp, Betty lamp, Butter lamp, Flash-lamp, Gas lighting, Gas mantle, Kerosene lamps, Lanterns, Limelights, Oil lamps, Tilley lamp, Bunsen burner, Candle, Embers, Explosives, Fire, Fire whirl, Fireworks, Flamethrower, Muzzle flash, Rubens' tube, Torch, Nuclear and high-energy particle and Annihilation. Celestial and atmospheric such as Astronomical objects, Sun (sunlight, solar radiation), Corona, Photosphere, Stars (Starlight), Nova/supernova/hypernova, Galaxies, Milky Way, Star clusters, Deep sky objects, Quasars, Accretion discs, Blazars, Magnetars, Pulsars, Atmospheric entry, Meteors, Meteor showers, Bolide, Earth-grazing fireball, Lightning (Plasma), Sprite (lightning), Ball lightning, Upper-atmospheric lightning, Dry lightning, Aurorae, Čerenkov radiation, Luminescence, Chemiluminescence, Bioluminescence, Aequorea Victoria, Antarctic krill, Cavitation bubbles, Foxfire, Glowworm, Luciferase, Panellus stipticus, Parchment worm, Piddock, Electrochemiluminescence and Crystalloluminescence. Electroluminescence such as Light-emitting diodes, Organic light-emitting diodes, Polymer light-emitting diodes, AMOLED, Light-emitting electrochemical cell, Electroluminescent wires, Field-induced polymer electroluminescent, Laser, Chemical laser, Dye laser, Free-electron laser, Gas dynamic laser, Gas laser, Ion laser, Laser diode, Metal-vapor laser, Nonlinear optics, Quantum well laser, Ruby laser, Solid-state laser, Cathodoluminescence, Mechanoluminescence, Triboluminescence, Fractoluminescence, Piezoluminescence, Sonoluminescence, Photoluminescence, Fluorescence, Phosphorescence, Radioluminescence, Thermoluminescence, Cryoluminescence, Luminous efficacy and Photometry (optics).

Materials, research method and experimental techniques

In this study, different types of molecular imaging and dynamics of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with Androgens/Anabolic Steroids (AAS) or Testosterone derivatives through tracking of Helium-4 nucleus (Alpha particle) under synchrotron radiation by means of Tetrabutylammonium Peroxymonosulfate (TBAO) was performed in the presence of six different phenyl substituted Manganese (III) β-Trifluoromethyl-meso-tetraphenylporphyrins ($TPPH_2$) (Mn-Pors) and imidazole in CH_2Cl_2 using nanomaterials analysis different methods and techniques such as Analytical Ultracentrifugation, Atomic Absorption Spectroscopy (AAS), Auger Electron Diffraction (AED), Auger Electron Spectroscopy (AES), Atomic Force Microscopy (AFM), Atomic Fluorescence Spectroscopy (AFS), Atom Probe Field Ion Microscopy (APFIM), Appearance Potential Spectroscopy (APS), Angle Resolved Photoemission Spectroscopy (ARPES), Angle Resolved Ultraviolet Photoemission Spectroscopy (ARUPS), Attenuated Total Reflectance (ATR), BET Surface Area Measurement (BET) (BET from Brunauer, Emmett, Teller), Bimolecular Fluorescence Complementation (BiFC), Backscatter Kikuchi Diffraction (BKD), Bioluminescence Resonance Energy Transfer (BRET), Back Scattered Electron Diffraction (BSED),

Coaxial Impact Collision Ion Scattering Spectroscopy (CAICISS), Coherent Anti-Stokes Raman Spectroscopy (CARS), Convergent Beam Electron Diffraction (CBED), Charge Collection Microscopy (CCM), Coherent Diffraction Imaging (CDI), Capillary Electrophoresis (CE), Cryo-Electron Tomography (CET), Cathodoluminescence (CL), Confocal Laser Scanning Microscopy (CLSM), Correlation Spectroscopy (COSY), Cryo-Electron Microscopy (Cryo-EM), Cryo-Scanning Electron Microscopy (Cryo-SEM), Cyclic Voltammetry (CV), Dielectric Thermal Analysis (DE(T)A), De Haas-van Alphen Effect (dHvA), Differential Interference Contrast Microscopy (DIC), Dielectric Spectroscopy (Dielectric spectroscopy), Dynamic Light Scattering (DLS), Deep-Level Transient Spectroscopy (DLTS), Dynamic Mechanical Analysis (DMA), Dual Polarisation Interferometry (DPI), Diffuse Reflection Spectroscopy (DRS), Differential Scanning Calorimetry (DSC), Differential Thermal Analysis (DTA), Dynamic Vapour Sorption (DVS), Electron Beam Induced Current (EBIC), Elastic (Non-Rutherford) Backscattering Spectrometry (EBS), Electron Backscatter Diffraction (EBSD), Exclusive Correlation Spectroscopy (ECOSY), Electrical Capacitance Tomography (ECT), Energy-Dispersive Analysis of X-Rays (EDAX), Electrically Detected Magnetic Resonance (EDMR), Energy Dispersive X-Ray Spectroscopy (EDS or EDX), Electron Energy Loss Spectroscopy (EELS), Energy Filtered Transmission Electron Microscopy (EFTEM), Electron Induced Desorption (EID), Electrical Impedance Tomography and Electrical Resistivity Tomography (EIT and ERT), Electroluminescence (EL), Electron Crystallography, Electrophoretic Light Scattering (ELS), Electron Nuclear Double Resonance (ENDOR), Electron Probe Microanalysis (EPMA), Electron Paramagnetic Resonance Spectroscopy (EPR), Elastic Recoil Detection or Elastic Recoil Detection Analysis (ERD or ERDA), Electron Spectroscopy for Chemical Analysis (ESCA), Electron Stimulated Desorption (ESD), Environmental Scanning Electron Microscopy (ESEM), Electrospray Ionization Mass Spectrometry or Electrospray Mass Spectrometry (ESI-MS or ES-MS), Electron Spin Resonance Spectroscopy (ESR), Electrochemical Scanning Tunneling Microscopy (ESTM), Extended X-Ray Absorption Fine Structure (EXAFS), Exchange Spectroscopy (EXSY), Fluorescence Correlation Spectroscopy (FCS), Fluorescence Cross-Correlation Spectroscopy (FCCS), Field Emission Microscopy (FEM), Focused Ion Beam Microscopy (FIB), Field Ion Microscopy-Atom Probe (FIM-AP), Flow Birefringence, Fluorescence Anisotropy, Fluorescence Lifetime Imaging (FLIM), Fluorescence Microscopy, Feature-Oriented Scanning Probe Microscopy (FOSPM), Fluorescence Resonance Energy Transfer (FRET), Forward Recoil Spectrometry (FRS), Fourier Transform Ion Cyclotron Resonance or Fourier Transform Mass Spectrometry (FTICR or FT-MS), Fourier Transform Infrared Spectroscopy (FTIR), Gas Chromatography-Mass Spectrometry (GC-MS), Glow Discharge Mass Spectrometry (GDMS), Glow Discharge Optical Spectroscopy (GDOS), Grazing Incidence Small Angle X-Ray Scattering (GISAXS), Grazing Incidence X-Ray Diffraction (GIXD), Grazing Incidence X-Ray Reflectivity (GIXR), Gas-Liquid Chromatography (GLC), High Angle Annular Dark-Field Imaging (HAADF), Helium Atom Scattering (HAS), High Performance Liquid Chromatography (HPLC), High Resolution Electron Energy Loss Spectroscopy (HREELS), High-Resolution Electron Microscopy (HREM), High-Resolution Transmission Electron Microscopy (HRTEM), Heavy-Ion Elastic Recoil Detection Analysis (HI-ERDA), High-Energy Proton Induced X-Ray Emission (HE-PIXE), Ion Induced Auger Electron Spectroscopy (IAES), Ion Beam Analysis (IBA), Ion Beam Induced Charge Microscopy (IBIC), Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES), Inductively Coupled Plasma Mass Spectrometry (ICP-MS), Immunofluorescence, Ion Cyclotron Resonance (ICR), Inelastic Electron Tunneling Spectroscopy (IETS), Intelligent Gravimetric Analysis (IGA), Inert Gas Fusion (IGF), Ion Induced X-Ray Analysis (IIX), Ion Neutralization Spectroscopy (INS), Inelastic Neutron Scattering, Infrared Non-Destructive Testing of Materials (IRNDT), Infrared Spectroscopy (IRS), Ion Scattering Spectroscopy (ISS), Isothermal Titration Calorimetry (ITC), Intermediate Voltage Electron Microscopy (IVEM), Low-Angle Laser Light Scattering (LALLS), Liquid Chromatography-Mass Spectrometry (LC-MS), Low-Energy Electron Diffraction

(LEED), Low-Energy Electron Microscopy (LEEM), Low-Energy Ion Scattering (LEIS), Laser Induced Breakdown Spectroscopy (LIBS), Laser Optical Emission Spectroscopy (LOES), Light (Raman) Scattering (LS), Matrix-Assisted Laser Desorption/Ionization (MALDI), Molecular Beam Epitaxy (MBE), Medium Energy Ion Scattering (MEIS), Magnetic Force Microscopy (MFM), Magnetic Induction Tomography (MIT), Multiphoton Fluorescence Microscopy (MPM), Magnetic Resonance Force Microscopy (MRFM), Magnetic Resonance Imaging (MRI), Mass Spectrometry (MS), Tandem Mass Spectrometry (MS/MS), Mechanically Stimulated Gas Emission (MSGE), Mössbauer Spectroscopy, Microthermal Analysis (MTA), Neutron Activation Analysis (NAA), Nanovid Microscopy, Neutron Diffraction (ND), Neutron Depth Profiling (NDP), Near Edge X-Ray Absorption Fine Structure (NEXAFS), Nuclear Inelastic Scattering/ Absorption (NIS), Nuclear Magnetic Resonance Spectroscopy (NMR), Nuclear Overhauser Effect Spectroscopy (NOESY), Nuclear Reaction Analysis (NRA), Near-Field Optical Microscopy (NSOM), Optical Beam Induced Current (OBIC), Optically Detected Magnetic Resonance (ODNMR), Optical Emission Spectroscopy (OES), Osmometry (Osmometry), Positron Annihilation Spectroscopy (PAS), Photoacoustic Spectroscopy, Photoacoustic Tomography or Photoacoustic Computed Tomography (PAT or PACT), Photoemission of Adsorbed Xenon (PAX), Photocurrent Spectroscopy (PC or PCS), Phase Contrast Microscopy, Photoelectron Diffraction (PhD), Photodesorption (PD), Potentiodynamic Electrochemical Impedance Spectroscopy (PDEIS), Photothermal Deflection Spectroscopy (PDS), Photoelectron Diffraction (PED), Parallel Electron Energy Loss Spectroscopy (PEELS), Photoemission Electron Microscopy or Photoelectron Emission Microscopy (PEEM), Photoelectron Spectroscopy (PES), Photon-Induced Near-Field Electron Microscopy (PINEM), Particle (or Proton) Induced Gamma-Ray Spectroscopy (PIGE), Particle (or Proton) Induced X-Ray Spectroscopy (PIXE), Photoluminescence (PL), Porosimetry, Powder Diffraction, Photothermal Microspectroscopy (PTMS), Photothermal Spectroscopy (PTS), Quasielastic Neutron Scattering (QENS), Raman Spectroscopy (Raman), Resonant Anomalous X-Ray Scattering (RAXRS), Rutherford Backscattering Spectrometry (RBS), Reflection Electron Microscopy (REM), Reflectance Difference Spectroscopy (RDS), Reflection High Energy Electron Diffraction (RHEED), Resonance Ionization Mass Spectrometry (RIMS), Resonant Inelastic X-Ray Scattering (RIXS), Resonance Raman Spectroscopy (RR Spectroscopy), Selected Area Diffraction (SAD), Selected Area Electron Diffraction (SAED), Scanning Auger Microscopy (SAM), Small Angle Neutron Scattering (SANS), Small Angle X-Ray Scattering (SAXS), Surface Composition by Analysis of Neutral Species and Ion-Impact Radiation (SCANIIR), Scanning Confocal Electron Microscopy (SCEM), Spectroscopic Ellipsometry (SE), Size Exclusion Chromatography (SEC), Surface Enhanced Infrared Absorption Spectroscopy (SEIRA), Scanning Electron Microscopy (SEM), Surface Enhanced Raman Spectroscopy (SERS), Surface Enhanced Resonance Raman Spectroscopy (SERRS), Surface Extended X-Ray Absorption Fine Structure (SEXAFS), Scanning Ion-Conductance Microscopy (SICM), Solid Immersion Lens (SIL), Solid Immersion Mirror (SIM), Secondary Ion Mass Spectrometry (SIMS), Sputtered Neutral Species Mass Spectrometry (SNMS), Scanning Near-Field Optical Microscopy (SNOM), Single Photon Emission Computed Tomography (SPECT), Scanning Probe Microscopy (SPM), Selected-Reaction-Monitoring Capillary-Electrophoresis Mass-Spectrometry (SRM-CE/MS), Solid-State Nuclear Magnetic Resonance (SSNMR), Stark Spectroscopy, Stimulated Emission Depletion Microscopy (STED), Scanning Transmission Electron Microscopy (STEM), Scanning Tunneling Microscopy (STM), Scanning Tunneling Spectroscopy (STS), Surface X-Ray Diffraction (SXRD), Thermoacoustic Tomography or Thermoacoustic Computed Tomography (TAT or TACT), Transmission Electron Microscope/ Microscopy (TEM), Thermogravimetric Analysis (TGA), Transmitting Ion Kinetic Analysis (TIKA), Thermal Ionization Mass Spectrometry (TIMS), Total Internal Reflection Fluorescence Microscopy (TIRFM), Photothermal Lens Spectroscopy (TLS), Thermomechanical Analysis (TMA), Time-of-Flight Mass Spectrometry (TOF-MS),

Two-Photon Excitation Microscopy, Total Reflection X-Ray Fluorescence Analysis (TXRF), Ultrasound Attenuation Spectroscopy, Ultrasonic Testing, UV-Photoelectron Spectroscopy (UPS), Ultra Small-Angle Neutron Scattering (USANS), Ultra Small-Angle X-Ray Scattering (USAXS), Ultraviolet-Visible Spectroscopy (UV-Vis), Video-Enhanced Differential Interference Contrast Microscopy (VEDIC), Voltammetry, Wide Angle X-Ray Scattering (WAXS), Wavelength Dispersive X-Ray Spectroscopy (WDX or WDS), X-Ray Induced Auger Electron Spectroscopy (XAES), Near Edge X-Ray Absorption Fine Structure (XANES or NEXAFS), X-Ray Absorption Spectroscopy (XAS), X-Ray Crystal Truncation Rod Scattering (X-CTR), X-Ray Crystallography, X-Ray Diffuse Scattering (XDS), X-Ray Photoelectron Emission Microscopy (XPEEM), X-Ray Photoelectron Spectroscopy (XPS), X-Ray Diffraction (XRD), X-Ray Resonant Exchange Scattering (XRES), X-Ray Fluorescence Analysis (XRF), X-Ray Reflectivity (XRR), X-Ray Raman Scattering (XRS), X-Ray Standing Wave Technique (XSW) and so on. Furthermore, it should be noted that electron-deficient and bulky substituents on the phenyl groups lowered the catalytic activities of the corresponding Mn-Por and reduce the rate of over oxidation process. Less bulky sulfides with electron-rich Sulfur atoms showed greater reactivity in the oxidation and enhance the selectivity of sulfone products. The investigation of co-catalytic activities of axial Nitrogen donors in the presence of various Mn-Pors indicates the higher co-catalytic activities of weak π-donor pyridines than imidazoles in the presence of electron-deficient catalysts.

Results and Discussion

Development of more environmentally friendly synthetic processes is a rising interest in the chemical community. In addition to its abundance and for economical and safety reasons, Androgens/Anabolic Steroids (AAS) or Testosterone Derivatives has naturally become an alternative as an environmentally benign complex. Moreover, it has been found that reactions with Androgens/Anabolic Steroids (AAS) or Testosterone Derivatives can facilitate access to different reactivity and selectivity patterns compared with those observed with common organic ligands and nucleic acids due to their unique physical and chemical properties.

However, the use of Androgens/Anabolic Steroids (AAS) or Testosterone derivatives in organic reactions has serious limitations. For example, most organic Nano compounds and nucleic acids do not dissolve in Androgens/Anabolic Steroids (AAS) or Testosterone derivatives and many reactive substrates, catalysts, reagents and products are decomposed or deactivated in aqueous media. To overcome these drawbacks in the use of Androgens/Anabolic Steroids (AAS) or Testosterone derivatives as acceptor, surfactants can be used successfully which solubilize organic Nano materials and nucleic acids or form emulsions with them in Testosterone derivatives for consideration and investigation of molecular imaging and dynamics of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with Androgens/Anabolic Steroids (AAS) or Testosterone derivatives through tracking of Helium-4 nucleus (Alpha particle) under synchrotron radiation.

Conclusions, Perspectives and Future Studies

In the current study, we introduce a green catalytic method for C-C and C-N bond forming via Michael addition of Androgens/Anabolic Steroids (AAS) or Testosterone derivatives to electron-deficient nucleic acids using Zirconium(4+) tetrakis(dodecyl sulfate) [$Zr(DS)_4$] under mild conditions with high yields and selectivity has been developed. The reusability of the catalyst has been successfully examined without any noticeable loss of its catalytic activity using molecular imaging and dynamics of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with Androgens/Anabolic Steroids (AAS) or Testosterone derivatives through tracking of Helium-4 nucleus (Alpha particle) under synchrotron radiation. Furthermore, we strongly recommend and suggest investigation and study on molecular imaging and dynamics

of double-standard DNA/RNA of human preserving stem cells-binding Nano molecules with other Steroids' types, designer Nano drugs and Androgens through tracking of Helium-4 nucleus (Alpha particle) under synchrotron radiation in the future studies.

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