

KORTIKOSTEROIDI - STEROIDNI HORMONI KORE NADBUBREŽNE ŽLEZDE

FIZIOLOŠKO DEJSTVO ENDOGENIH (PRIRODNIH) KORTIKOSTEROIDA

- POKAZUJU BROJNE I RAZNOVRSNE FIZIOLOŠKE ULOGE:
- REGULIŠU METABOLIZAM UGLJENIH HIDRATA, PROTEINA, LIPIDA;

GLUKOKORTIKOIDI:

- DOPRINOSE NORMALNOM FUNKCIONISANJU KARDIOVASKULARNOG SISTEMA, IMUNOG SISTEMA, ENDOKRINOLOGIJSKOG SISTEMA, NERVENOG SISTEMA, BUBREGA I SKELETNIH MIŠIĆA
- REGULIŠU ODBRANU ORGANIZMA OD STRESNIH SITUACIJA, ŠTETNIH NADRAŽAJA I PROMENE SREDINE
- KOD SISARA JE NAJZNAČAJNIJI **KORTIZOL** (CORTISOL, HYDROCORTISONE)

MINERALOKORTIKOIDI:

- REGULIŠU BALANS TEČNOSTI (VODE) I ELEKTROLITA (NEORGANSKIH KATJONA I ANJONA);
- KOD SISARA JE NAJZNAČAJNIJI **ALDOSTERON**

KORTIKOSTEROIDI

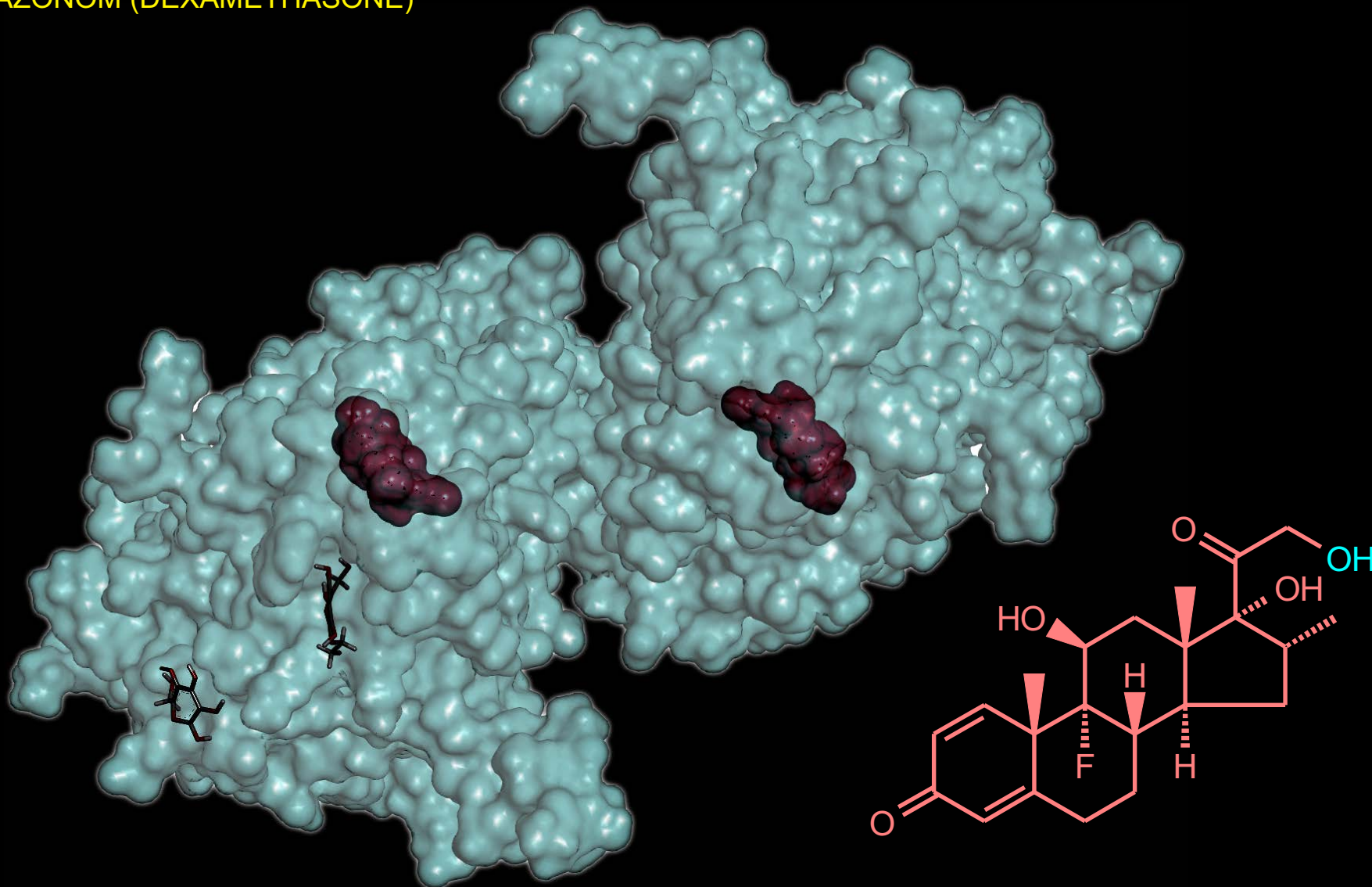
U ORGANIZMU, KORTIKOSTEROIDI OSTVARUJU SVOJU ULOGU REVERZIBILNOM INTERAKCIJOM SA SPECIFIČNIM RECEPTORIMA.

GLUKOKORTIKOIDI SE VEZUJU ZA GLUKOKORTIKOIDNI RECEPTOR, POZNAT KAO NR3C1 (PODGRUPA JEZGARSKIH RECEPTORA 3, GRUPA C, ČLAN 1).

MINERALOKORTIKOIDI SE VEZUJE ZA RECEPTOR POZNAT KAO ALDOSTERONSKI RECEPTOR ILI NR3C2 (PODGRUPA JEZGARSKIH RECEPTORA 3, GRUPA C, ČLAN 2).

U OBA SLUČAJA, MEHANIZAM DEJSTVA JE SLOŽEN I UKLJUČUJE TRANSKRIPCiju GENA.

KRISTALNA STRUKTURA LJUDSKOG GLUKOKORTIKOIDNOG RECEPTORA (NR3C1) U KOMPLEKSU SA DEKSAMETAZONOM (DEXAMETHASONE)



Crystal structure of a dimer complex of the human glucocorticoid receptor ligand-binding domain bound to dexamethasone and a TIF2 coactivator motif

Crystal structure of the glucocorticoid receptor ligand binding domain reveals a novel mode of receptor dimerization and coactivator recognition.

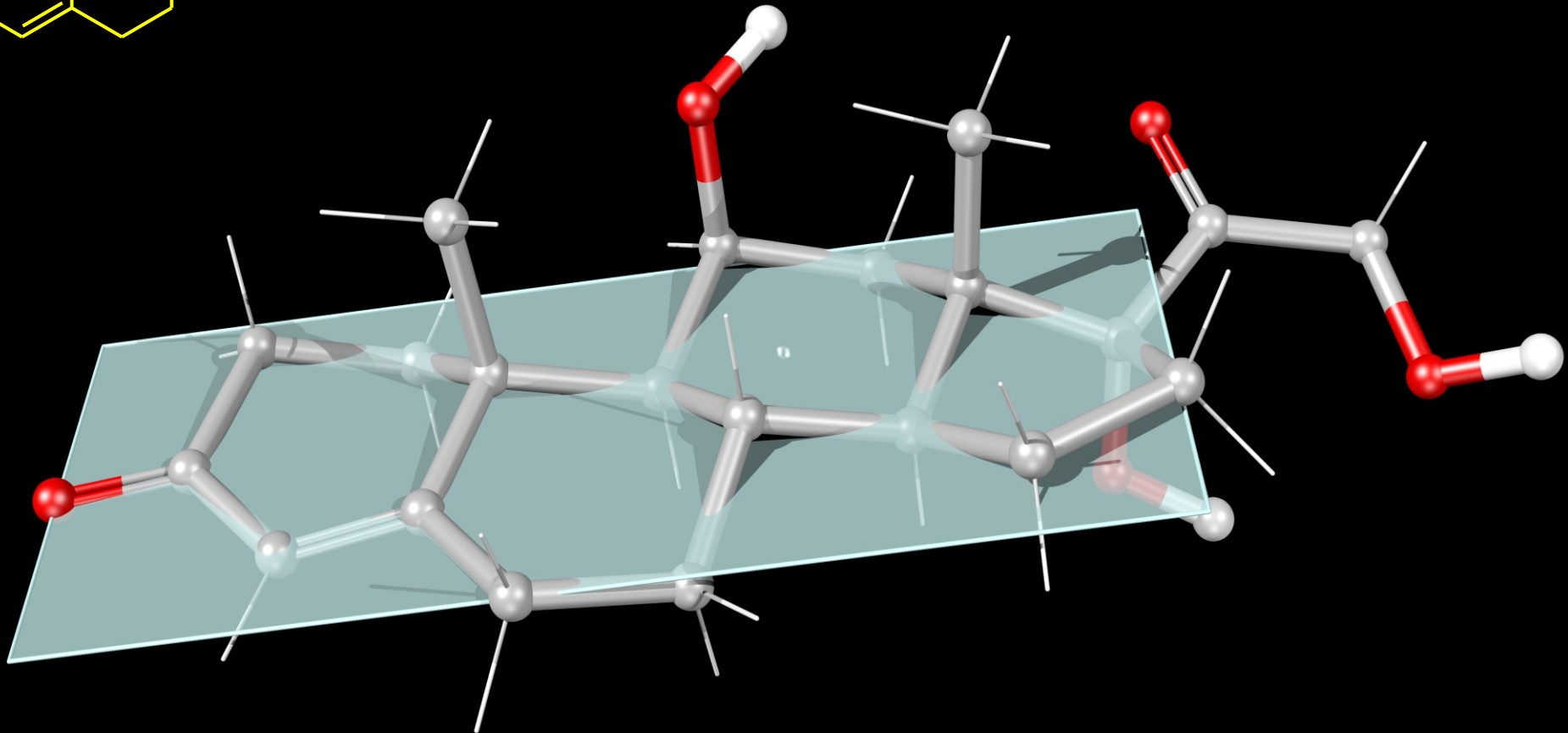
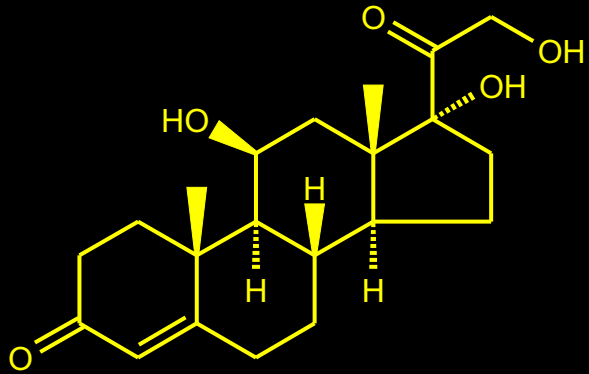
Bledsoe, R.B., Montana, V.G., Stanley, T.B., Delves, C.J., Apolito, C.J., Mckee, D.D., Consler, T.G., Parks, D.J., Stewart, E.L., Willson, T.M., Lambert, M.H., Moore, J.T., Pearce, K.H., Xu, H.E.

Journal: (2002) Cell(Cambridge,Mass.) 110: 93-105

- PRIMENJENI U DOZAMA KOJE SU VIŠESTRUKO VEĆE OD NORMALNIH, FIZIOLOŠKIH DOZA, KORTIKOSTEROIDI ISPOLJAVAJU FARMAKOLOŠKO, "LEKOVITO" DEJSTVO I TO:
 - SUZBIJAJU PATOLOŠKE EFEKTE ZAPALJENSKIH PROCESA (ANTI-INFLAMATORNO DEJSTVO), KAO ŠTO SU ALERGJSKE REAKCIJE (NPR. ALERGIJSKE REAKCIJE NA POLEN, UJEDE INSEKATA I DR.),
 - AUTO-IMUNA OBOLJENJA KADA ORGANIZAM NAPADA SOPSTVENA TKIVA (REUMATSKA OBOLJENJA) I DR.
- MEĐUTIM, IZAZIVAJU I TEŠKE SPOREDNE EFEKTE KOJI MOGU BITI I OPASNI PO ŽIVOT:
 - SLABLJENE IMUNITETA (IMUNOG ODGOVORA) I KONSEKVENTNO VEĆU PODLOŽNOST BAKTERIJSKIM, VIRUSNIM I DRUGIM INFEKCIJAMA
 - MOGU UBRZATI ŠIRENJE MALIGDNIH TUMORA
 - DOVODE DO ZADRŽAVANJA (RETENCIJE) VODE U ORGANIZMU KAO I POREMEĆAJA KONCENTRACIJE ELEKTROLITA, ŠTO MOŽE AKUTNO UGROZITI KARDIO-VASKULARNI SISTEM, RAD BUBREGA I DR.
 - SINTETIČKI ANALOZI KORTIKOSTEROIDA KOJI SADRŽE FLUOR IMAJU DALEKO BOLJI FARMAKOLOŠKI PROFIL OD PRIRODNIH (MANJE SPOREDNIH EFEKATA) TAKO DA SE UGLAVNOM I KORISTE U TERAPIJI.
 - KOLIKO JE MOGUĆE, TERAPIJA MORA BITI VREMENSKI OGRANIČENA

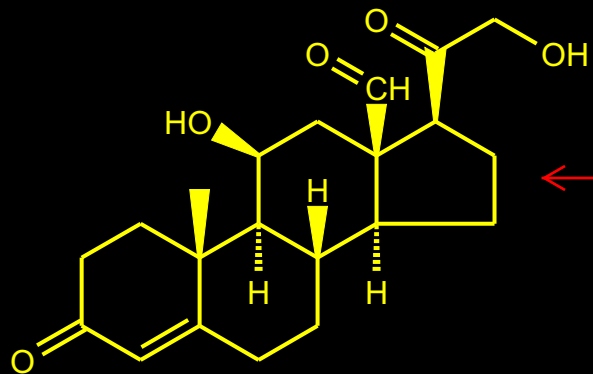
KORTIKOSTEROIDI - *GLUKOKORTIKOIDI*

ORGANIZAM ČOVEKA DNEVNO SINTETIZUJE OKO 10 mg KORTIZOLA

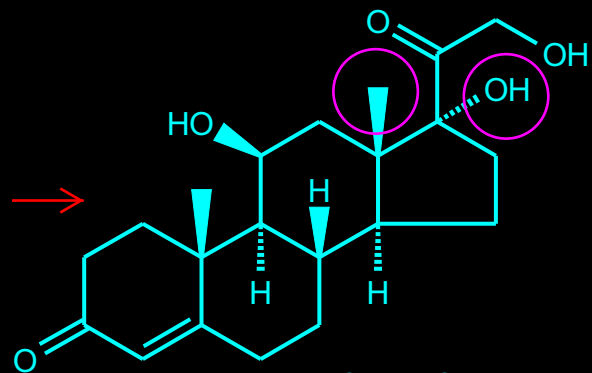


KORTIZOL (CORTISOL, HYDROCORTISONE)

KORTIKOSTEROIDI - *MINERALOKORTIKOIDI*

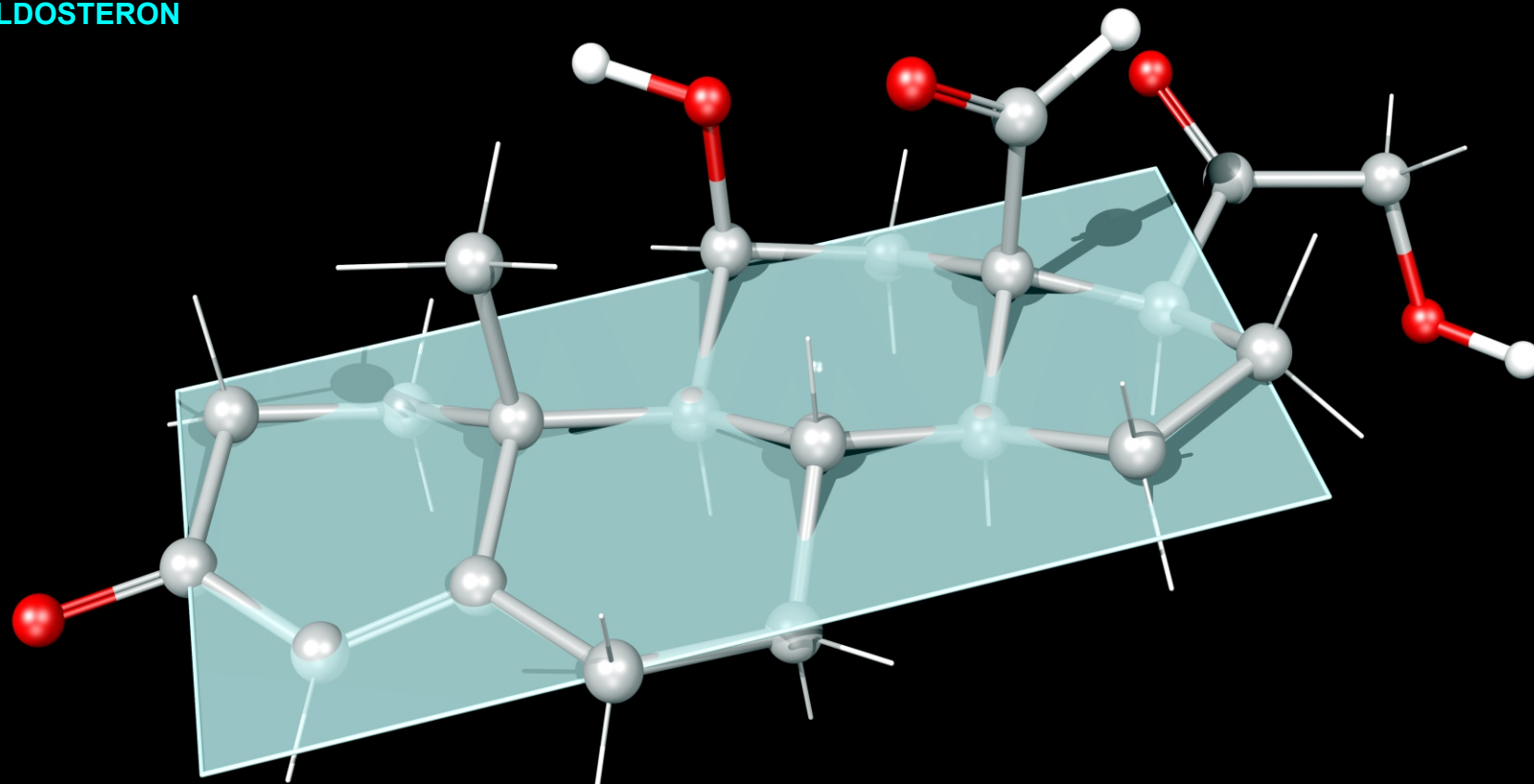


ALDOSTERON

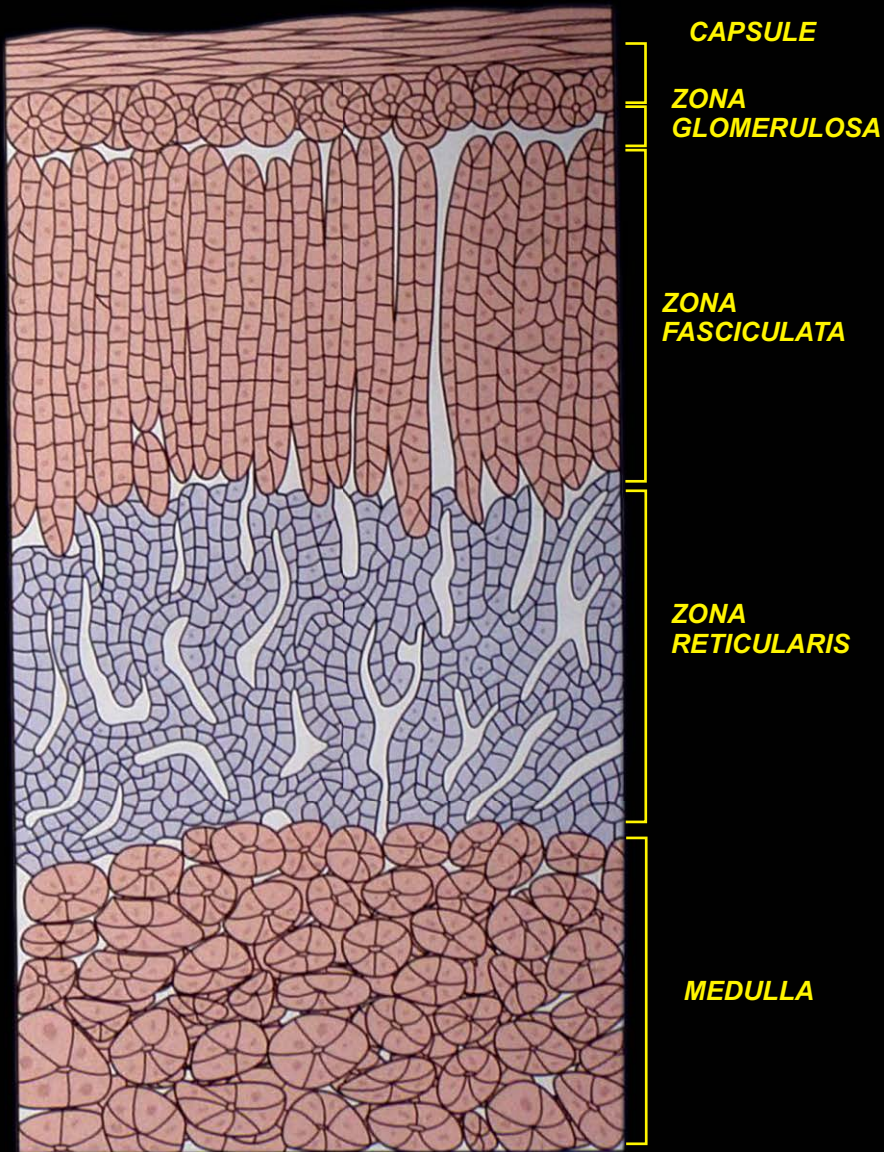
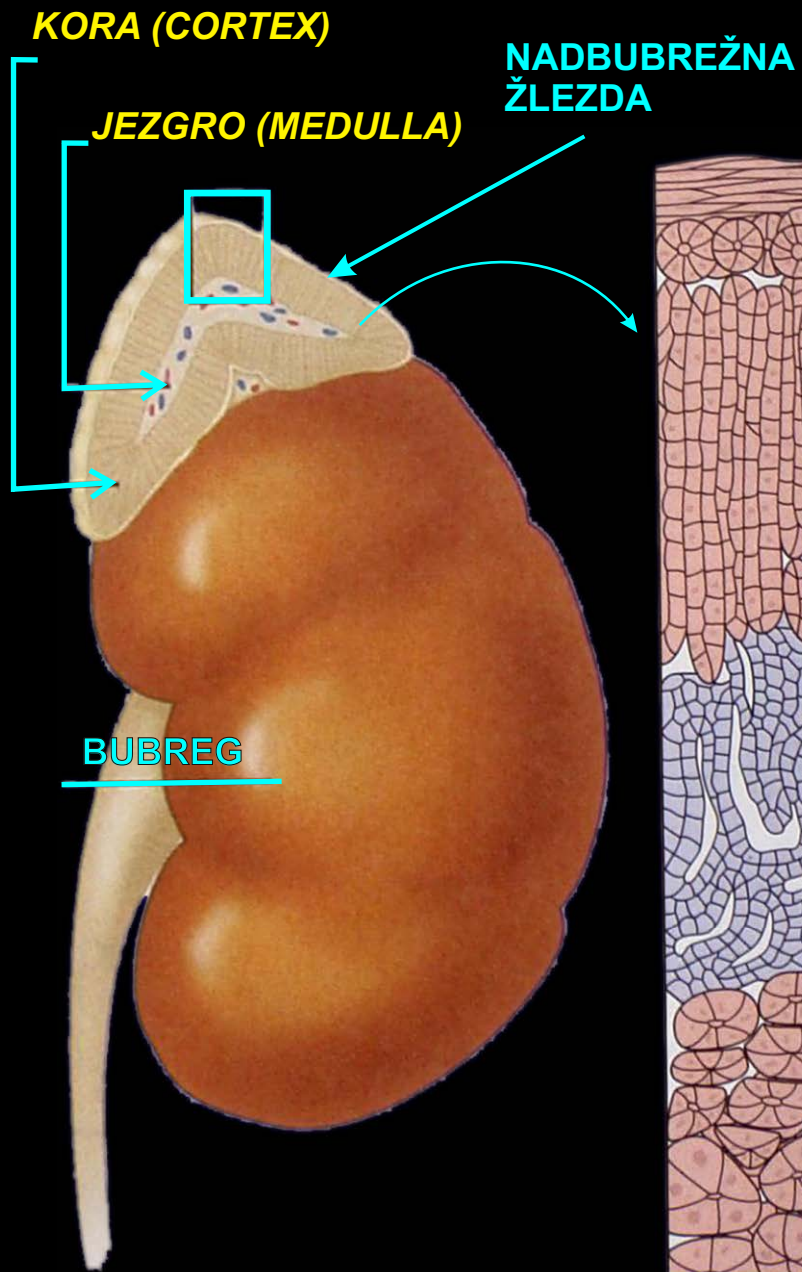


KORTIZOL

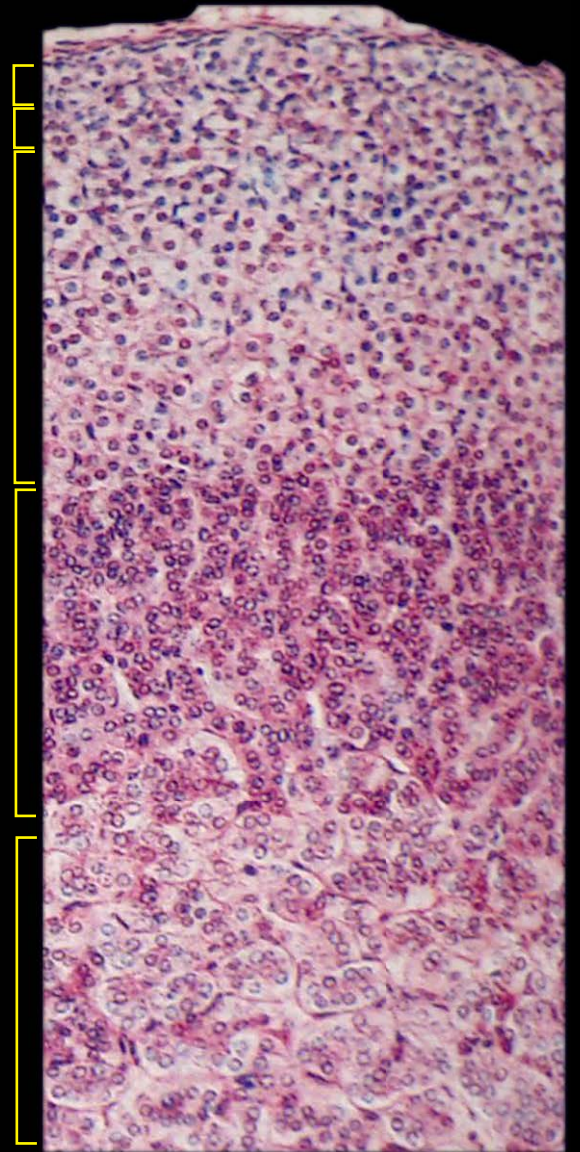
MALE STRUKTURNE RAZLIKE
USLOVLJAVAJU VELIKU
FARMAKOLOŠKU RAZLIKU



ALDOSTERON (ALDOSTERONE)



**SHEMATSKI PRIKAZ
HISTOLOŠKOG PREPARATA**



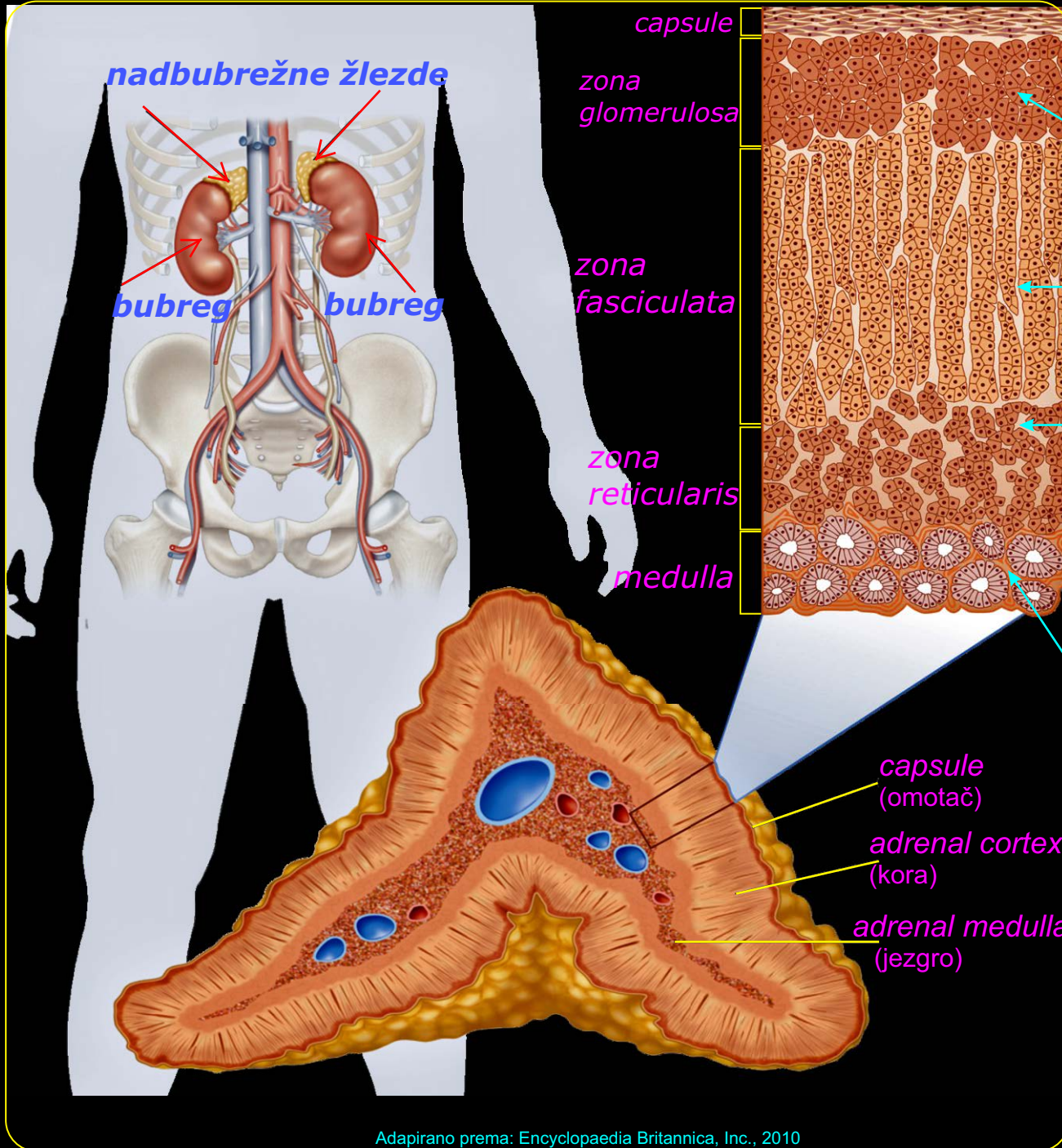
**ORIGINALNI
HISTOLOŠKI PREPARAT**

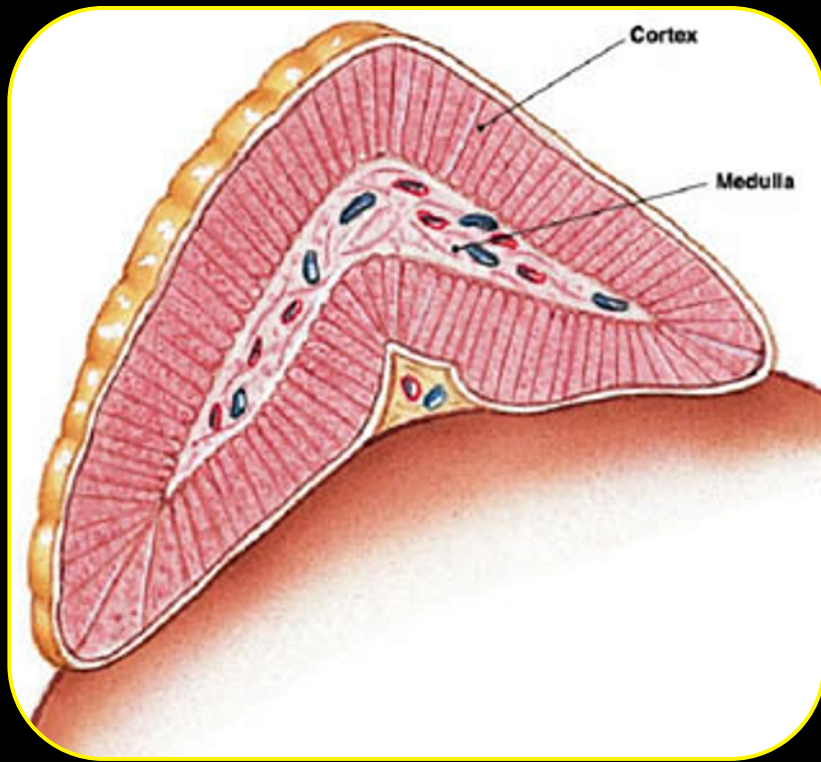
KORTIKOSTEROIDI - MESTO BIOSINTEZE POJEDINIHKORTIKOSTEROIDA

POJEDINI STEROIDNI HORMONI
LUČE SE U RAZLIČITIM DELOVIMA
KORE NADBUBREŽNE ŽLEZDE I TO:

- a) MINERALOKORTIKOSTEROIDI
(ALDOSTERON)
U REGIONU *Zona glomerulosa***
- b) GLUKOKORTIKOSTEROIDI
(KORTIZOL)
U REGIONU *Zona fasciculata***
- c) ANDROGENI STEROIDI
U REGIONU *Zona reticularis***

NESTEROIDNI HORMONI
(KATEHOLAMINI,
KAO EPINEFRIN I NOREPINEFRIN)
LIČE SE U JEZGRU NADBUBREŽNE
ŽLEZDE (*Adrenal medulla*)



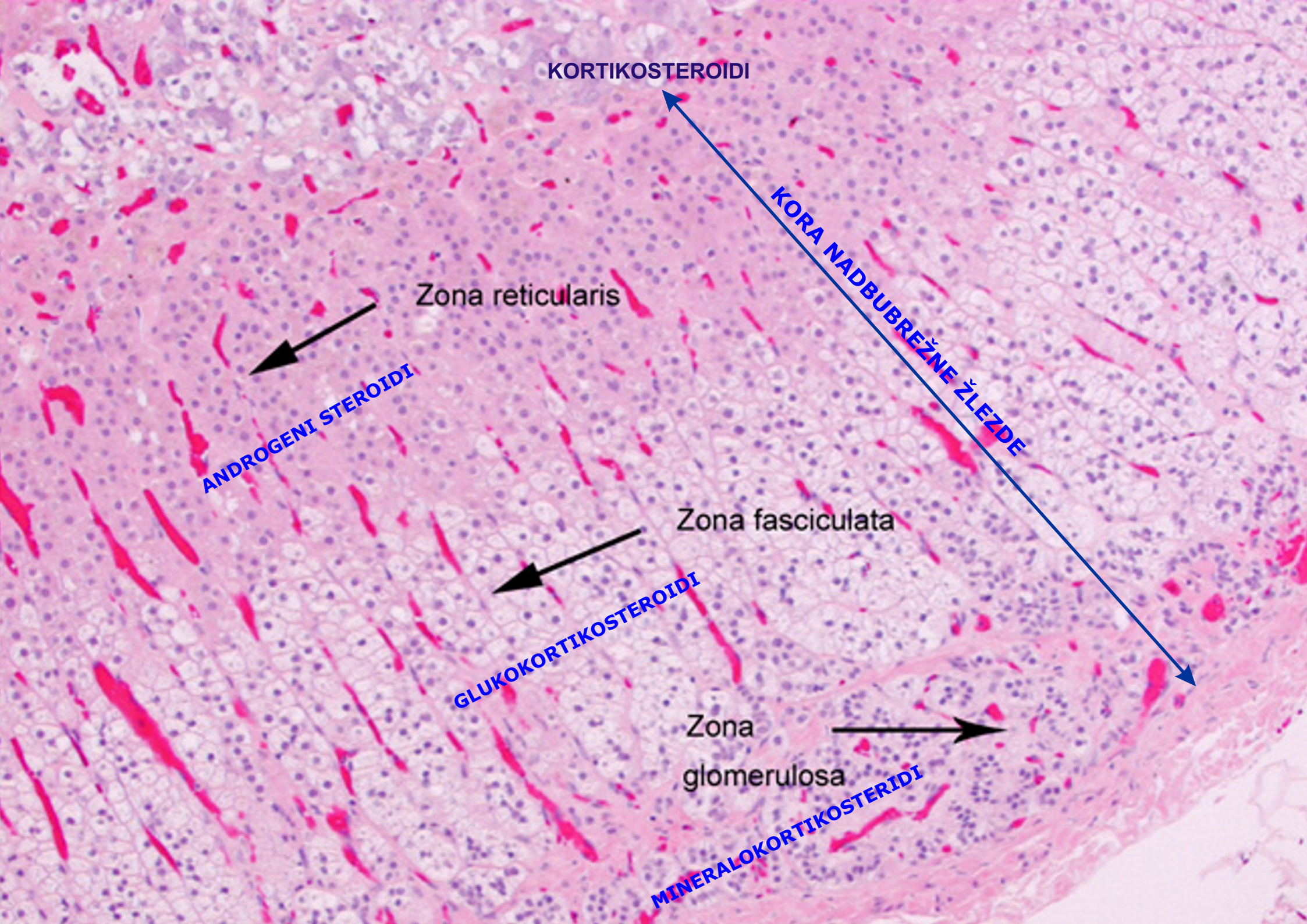


SHEMATSKI PRIKAZ
NADBUBREŽNE ŽLEZDE

KORTIKOSTEROIDI



ORIGINALNI HISTOLOŠKI PREPARAT
(OBOJEN MIKROSKOPSKIM BOJAMA).
JASNO SE UOČAVA RAZLIKA IZMEĐU
KORE (CORTEKS) I JEZGRA (MEDULLA).



KORTIKOSTEROIDI

KORA NADBUBREŽNE ŽLEZDE

Zona reticularis

ANDROGENI STEROIDI

Zona fasciculata

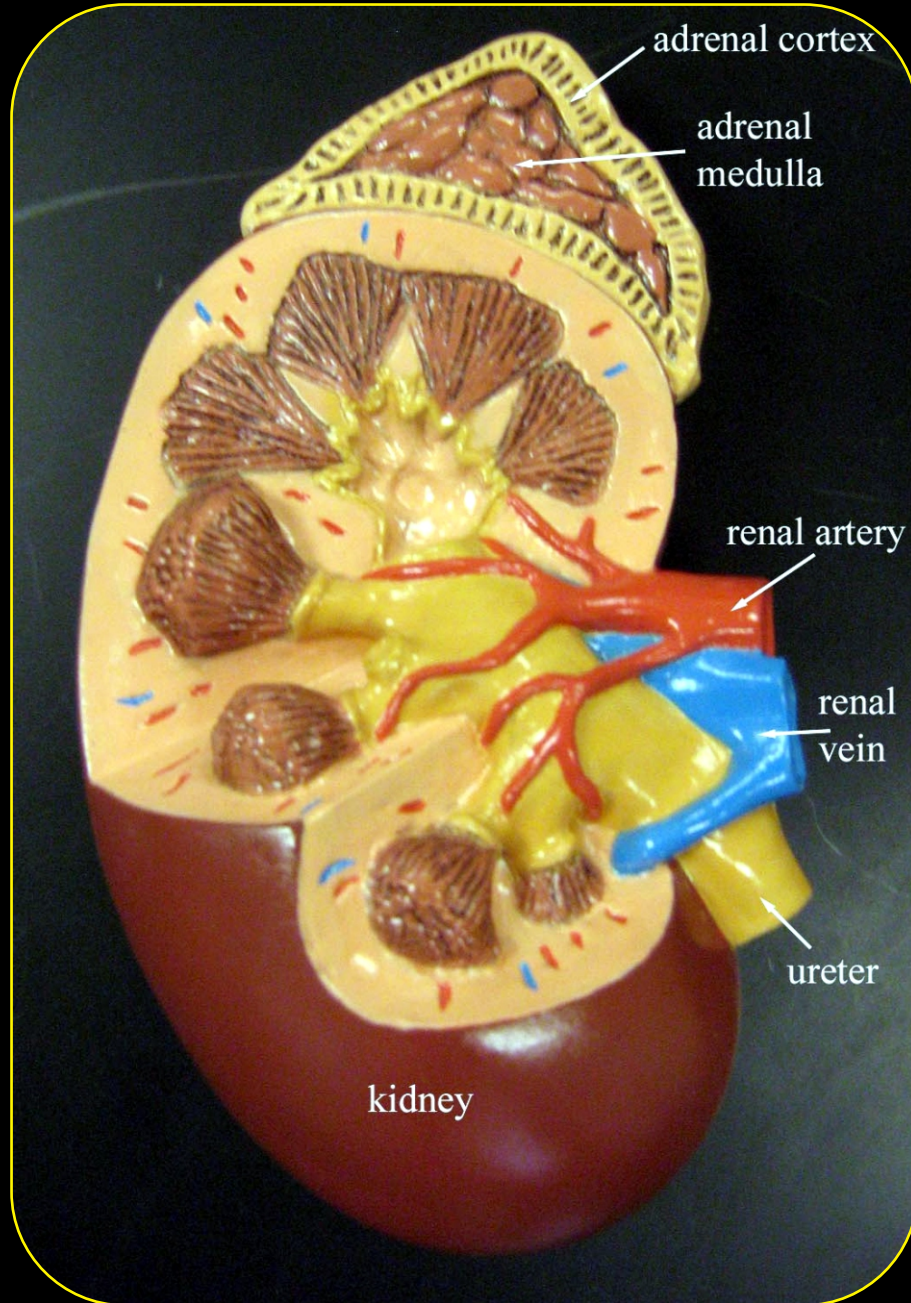
GLUKOKORTIKOSTEROIDI

Zona
glomerulosa

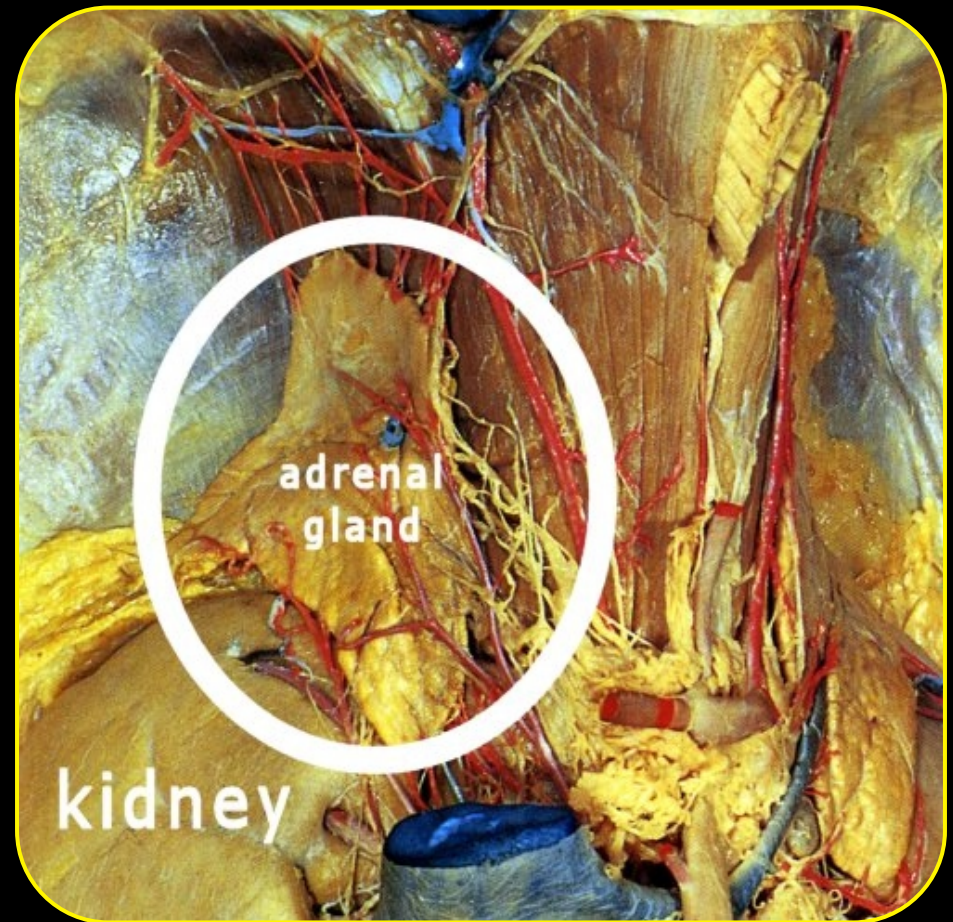
MINERALOKORTIKOSTEROIDI

KORTIKOSTEROIDI - IZGLED BUBREGA I NADBUBREŽNE ŽLEZDE

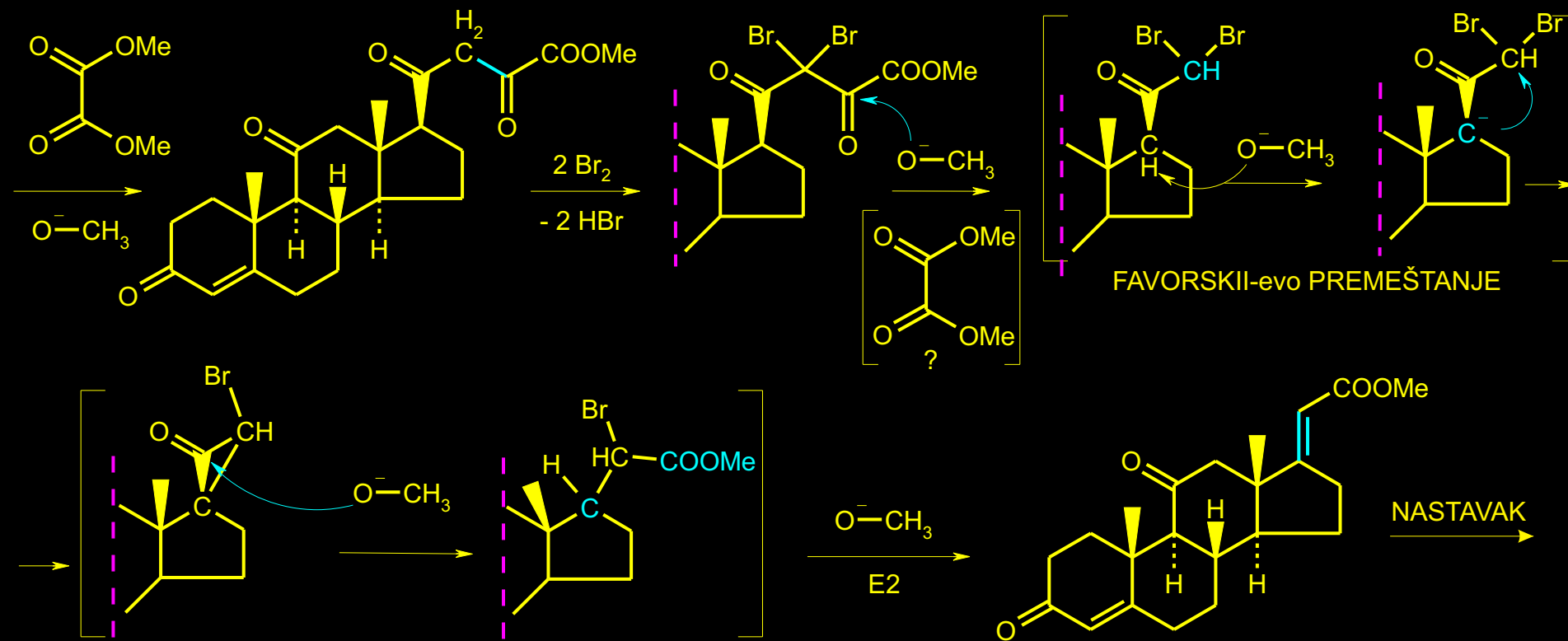
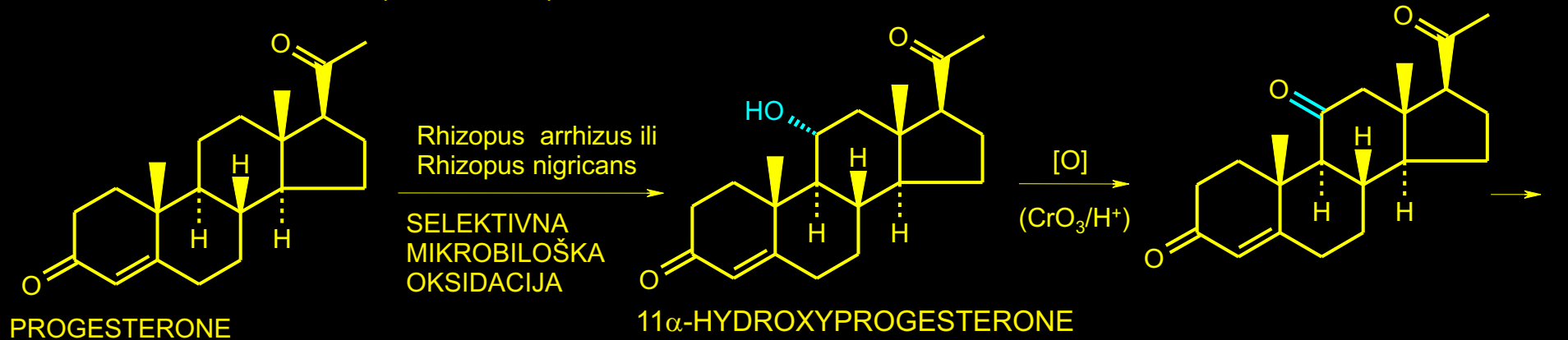
NADBUBREŽNA ŽLEZDA I BUBREG - MODEL



NADBUBREŽNA ŽLEZDA I BUBREG - ANATOMSKI PREPARAT

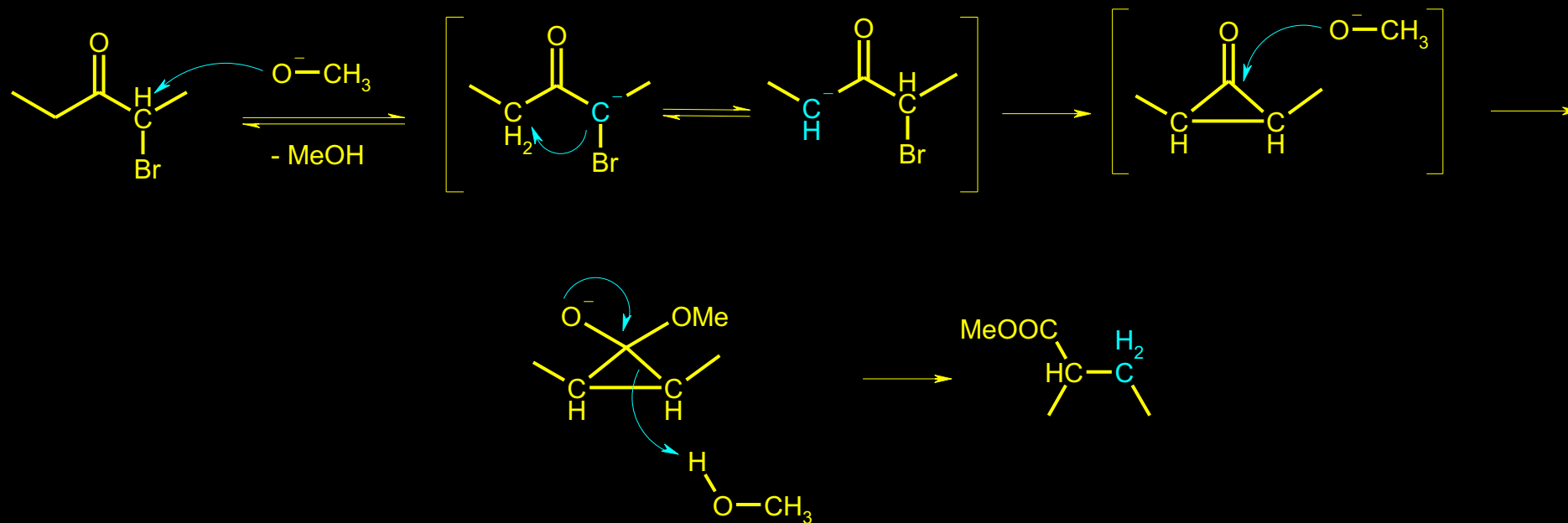


SINTEZA CORTISONE-a (KORTIZON) GLUCOCORTICOID

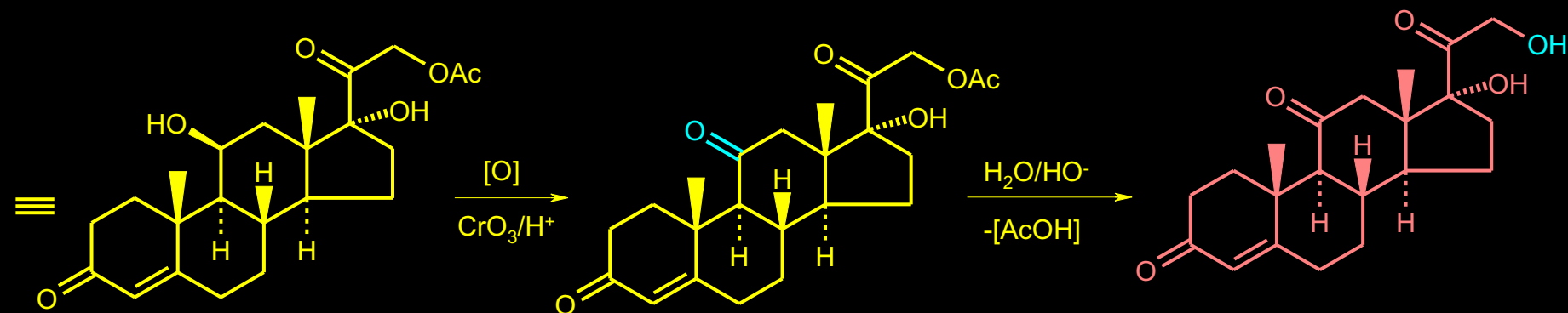
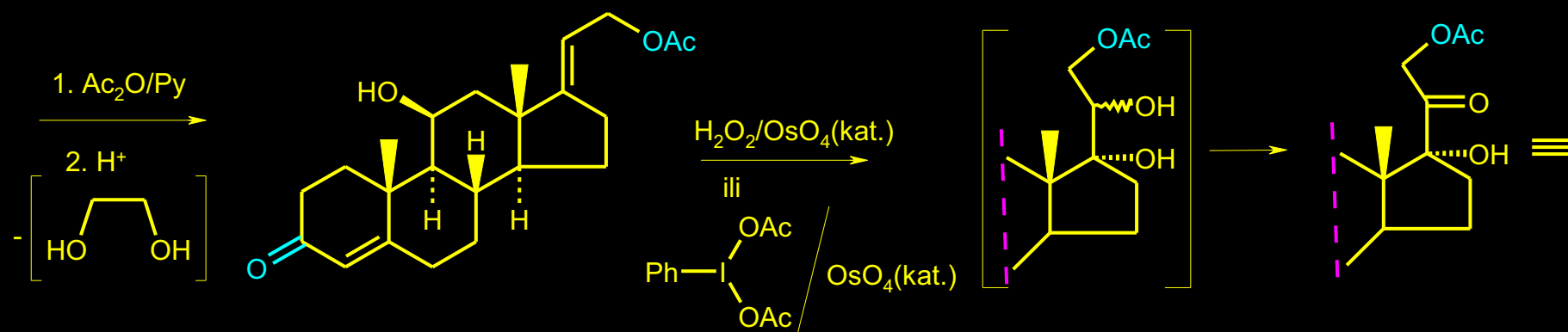
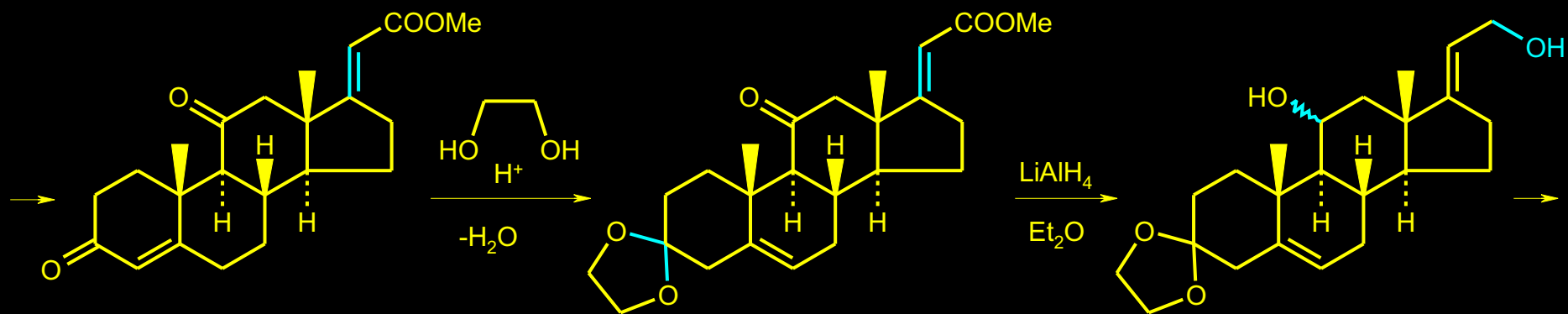


SINTEZA CORTISONE-a - nastavak

MEHANIZAM FAVORSKII-evog PREMEŠTANJA



SINTEZA CORTISONE-a - nastavak



hydrocortisone acetate

cortisone acetate

CORTISONE

Monograph Number: 2564

Title: [Cortisone](#)

CAS Registry Number: 53-06-5

CAS Name: 17,21-Dihydroxypregn-4-ene-3,11,20-trione

Additional Names: 17-hydroxy-11-dehydrocorticosterone; 11-dehydro-17-hydroxycorticosterone; 4-pregnene-17,21-diol-3,11,20-trione; Kendall's compound E; Wintersteiner's compound F; Reichstein's substance Fa

Trademarks: KE; Incortin; Cortone (Merck & Co.); Cortadren (Schering); Scheroson; Corlin; Cortogen (Schering); Adreson

Molecular Formula: C₂₁H₂₈O₅

Molecular Weight: 360.44.

Percent Composition: C 69.98%, H 7.83%, O 22.19%

Literature References: Isoln from suprarenal glands: Pfiffner *et al.*, *J. Biol. Chem.* **111**, 585 (1935); **116**, 291 (1936); Mason *et al.*, *ibid.* **114**, 613 (1936); Reichstein, *Helv. Chim. Acta* **19**, 1107 (1936); Kuizenga, Cartland, *Endocrinology* **24**, 526 (1939). Synthesis of the monoacetate from desoxycholic acid: Sarett, *J. Biol. Chem.* **162**, 601 (1946). Further development of prepn methods: Meystre, Wettstein, *Experientia* **3**, 185 (1947); *Helv. Chim. Acta* **30**, 1037, 1256 (1947); Reichstein *et al.*, *ibid.* **26**, 562, 705, 721 (1943); **27**, 821 (1944); Reichstein, **US 2403683** (1946); Kendall *et al.*, *J. Biol. Chem.* **166**, 345 (1946); Gallagher, **US 2447325** (1948); Peterson, Murray, *J. Am. Chem. Soc.* **74**, 1871 (1952); Perlman, *ibid.* 2126; Sarett, *ibid.* **70**, 1454 (1948); **71**, 2443 (1949); Mattox, Kendall, *ibid.* **70**, 882 (1948). Stereospecific total synthesis: Sarett *et al.*, *ibid.* **74**, 4974 (1952).

Properties: Rhombohedral platelets from 95% alcohol, mp 220-224° (some decompn) when heated in evac capillary. [α]_D²⁵ +209° (c = 1.2 in 95% alcohol); [α]_D²⁵546 +269° (c = 0.125 in benzene); [α]_D²⁵546 +248° (c = 0.1 to 0.2 in alcohol). uv max: 237 nm (ε 1.4 10⁴) see Mason *et al.*, *J. Biol. Chem.* **116**, 267 (1936); Wintersteiner, Pfiffner, *ibid.* 291. Fairly sol in cold methanol, ethanol, acetone; much less sol in ether, benzene, chloroform; slightly sol in water (28 mg/100 ml at 25°). The water soln is neutral. Gives orange-red soln with intense green fluorescence in concd H₂SO₄. Reduces Benedict's soln on heating.

Melting point: mp 220-224° (some decompn) when heated in evac capillary

Optical Rotation: [α]_D²⁵ +209° (c = 1.2 in 95% alcohol); [α]_D²⁵546 +269° (c = 0.125 in benzene); [α]_D²⁵546 +248° (c = 0.1 to 0.2 in alcohol)

Absorption maximum: uv max: 237 nm (ε 1.4 10⁴) see Mason *et al.*, *J. Biol. Chem.* **116**, 267 (1936); Wintersteiner, Pfiffner, *ibid.* 291

Derivative Type: 21-Acetate

CAS Registry Number: 50-04-4

Additional Names: Cortisone acetate

Trademarks: Cortistab (Boots); Cortelan (Glaxo); Cortisyl (HMR)

Molecular Formula: C₂₃H₃₀O₆

Molecular Weight: 402.48.

Percent Composition: C 68.64%, H 7.51%, O 23.85%

Properties: Flat needles from acetone; clusters of radiating rods from chloroform. Becomes opaque at 70-100°, mp 235-238° with slight sintering at 230°. [α]_D²⁵ +164° (c = 0.5 in acetone), [α]_D²⁵ +208 to +217° (dioxane). uv max: 238 nm (ε 1.58 10⁴), see Sarett, *J. Biol. Chem.* **162**, 630 (1946). Soly at 25° in water: 2.2 mg/100 ml; in propylene glycol 44 mg/100 ml; in chloroform 182 mg/g. Reduces ammoniacal silver nitrate soln at room temp. Sol in sulfuric acid giving a yellow soln without fluorescence (difference from hydrocortisone acetate).

Melting point: mp 235-238° with slight sintering at 230°

Optical Rotation: [α]_D²⁵ +164° (c = 0.5 in acetone); [α]_D²⁵ +208 to +217° (dioxane)

Absorption maximum: uv max: 238 nm (ε 1.58 10⁴)

Derivative Type: 21-Cyclopentanepropionate

CAS Registry Number: 509-00-2

Molecular Formula: C₂₉H₄₀O₆

Molecular Weight: 484.62.

Percent Composition: C 71.87%, H 8.32%, O 19.81%

Properties: Needles from diisopropyl ether, mp 158-161°. [α]_D²⁰ +190° (chloroform). uv max (ethanol): 239 nm (ε 16350). Sol in ether, glycols, vegetable oils, especially sesame, peanut, and corn oils.

Melting point: mp 158-161°

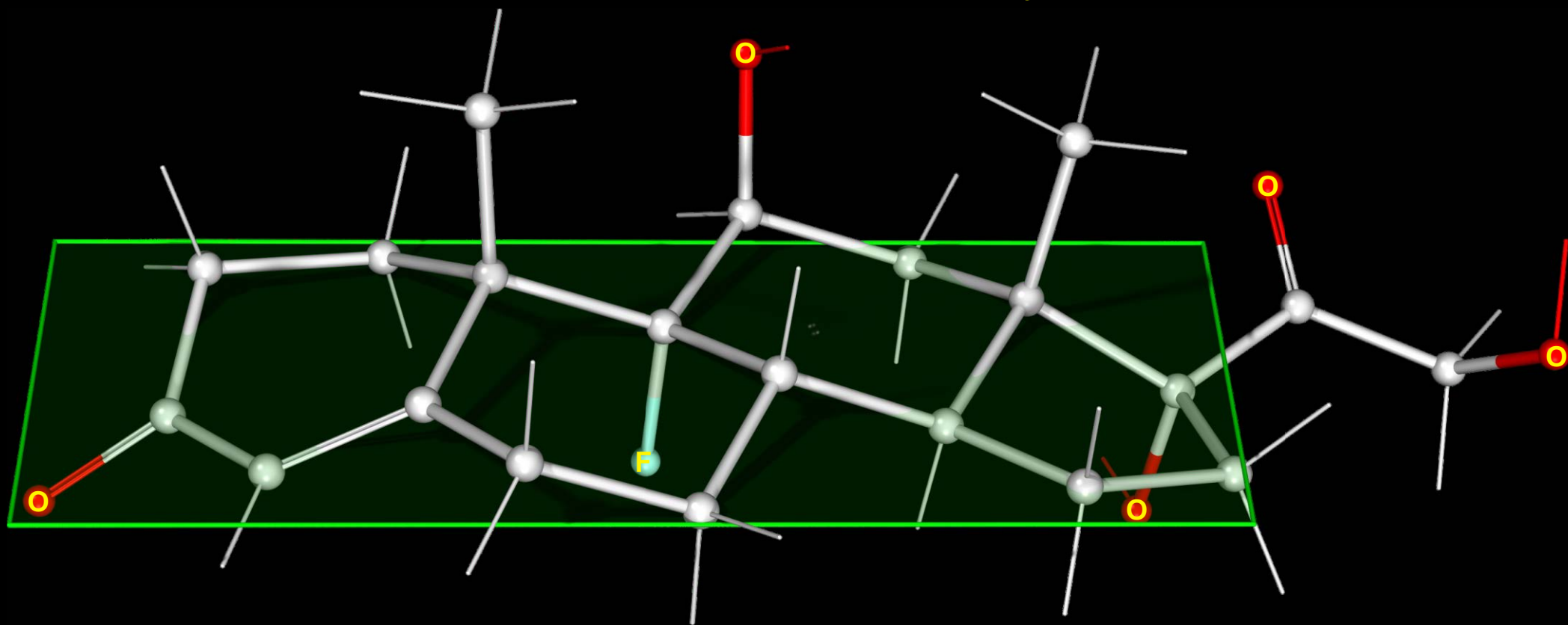
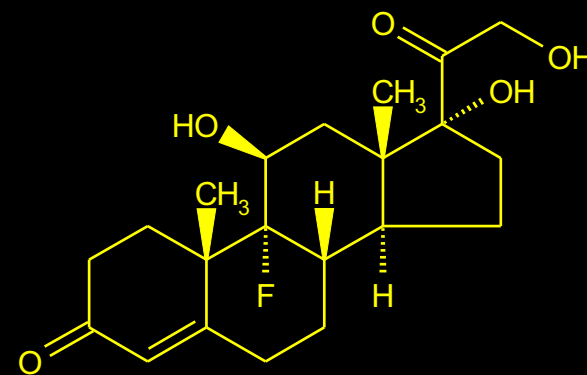
Optical Rotation: [α]_D²⁰ +190° (chloroform)

Absorption maximum: uv max (ethanol): 239 nm (ε 16350)

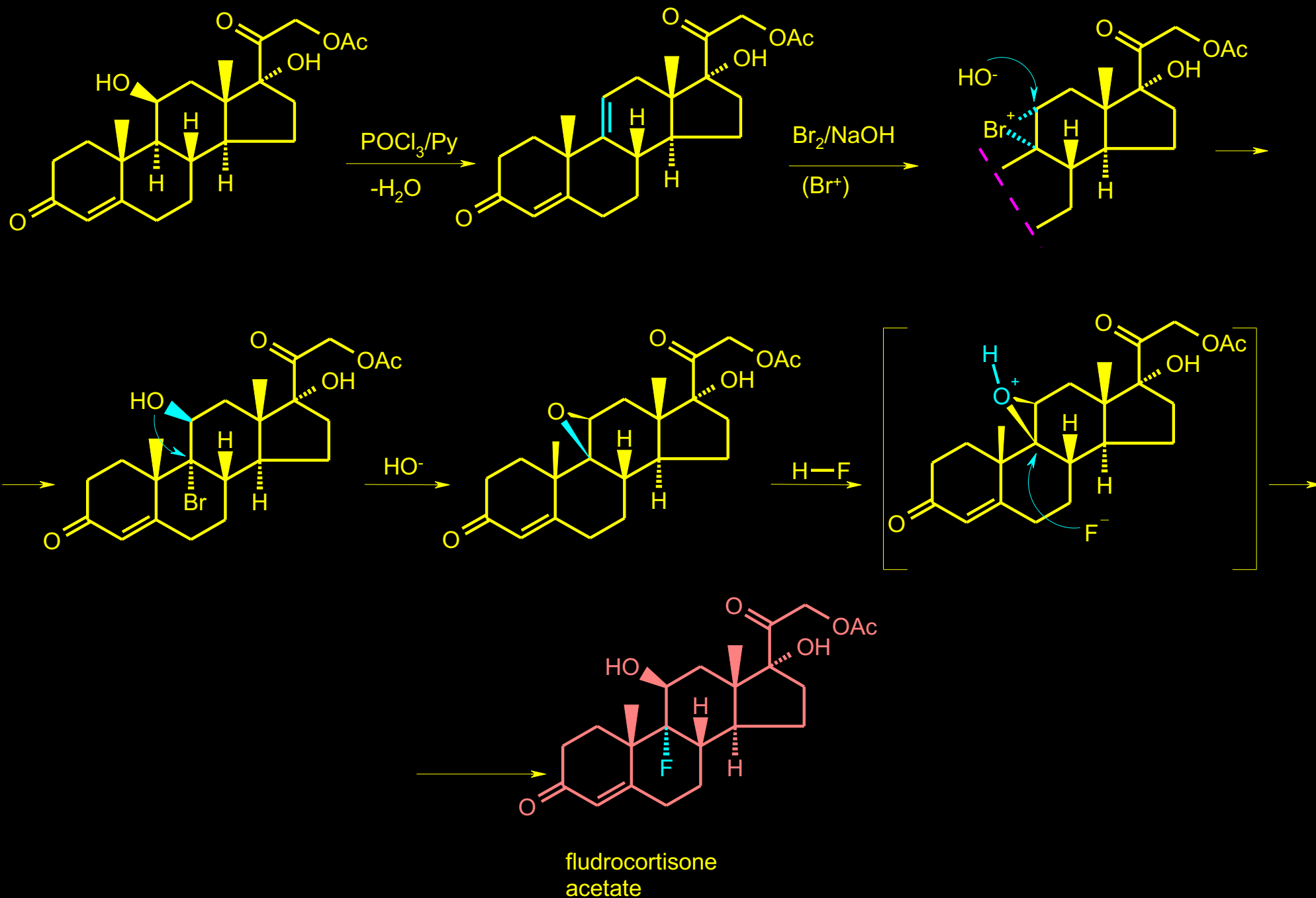
Therap-Cat: [Glucocorticoid](#).

Therap-Cat-Vet: Glucocorticoid, anti-inflammatory agent.

FLUDROCORTISONE (MINERALOCORTICOID)



SINTEZA FLUDROCORTISONE ACETATA



Monograph Number: 4156

Title: [Fludrocortisone](#)

CAS Registry Number: 127-31-1

CAS Name: (11 β)-9-Fluoro-11,17,21-trihydroxypregn-4-ene-3,20-dione

Additional Names: 9 β -fluorohydrocortisone; 9 β -fluoro-17-hydroxycorticosterone; 9 β -fluorocortisol; fludrocortisone; fluohydrisone; fluohydrocortisone

Trademarks: Astonin H (Merck KGaA)

Molecular Formula: C₂₁H₂₉FO₅

Molecular Weight: 380.45.

Percent Composition: C 66.30%, H 7.68%, F 4.99%, O 21.03%

Literature References: Prepn: J. Fried, E. F. Sabo, *J. Am. Chem. Soc.* **76**, 1455 (1954); **GB 792224**; J. Fried, **US 2852511** (both 1958 to Olin Mathieson). Series of articles on pharmacology and metabolism: *Arzneimittel-Forsch.* **21**, 1103-1158 (1971). Comprehensive description of the acetate: K. Florey, *Anal. Profiles Drug Subs.* **3** 281-306 (1974).

Properties: Crystals, dec 260-262°. [α]_D²³ +139° (c = 0.55 in 95% ethanol). uv max (ethanol): 239 nm (ϵ 17600). Soly in water: 0.14 mg/ml.

Optical Rotation: [α]_D²³ +139° (c = 0.55 in 95% ethanol)

Absorption maximum: uv max (ethanol): 239 nm (ϵ 17600)

Derivative Type: 21-Acetate

CAS Registry Number: 514-36-3

Trademarks: Alflorone (Merck & Co.); F-Cortef (Upjohn); Florinef (Bristol-Myers Squibb)

Molecular Formula: C₂₃H₃₁FO₆

Molecular Weight: 422.49.

Percent Composition: C 65.39%, H 7.40%, F 4.50%, O 22.72%

Properties: Crystals, polymorphic, mp 233-234° (occasionally mp 205-208°, resolidifying on further heating, then mp 226-228°). Crystallizing procedure: R. P. Graber, C. S. Snoddy, **US 2957013** (1960 to Merck & Co.). [α]_D²³ +123° (c = 0.64 in chloroform). uv max (ethanol): 238 nm (ϵ 16800). Soly (mg/ml): water 0.04; acetone 56; alc 20; chloroform 20; ether 4.

Melting point: Crystals, polymorphic, mp 233-234° (occasionally mp 205-208°, resolidifying on further heating, then mp 226-228°)

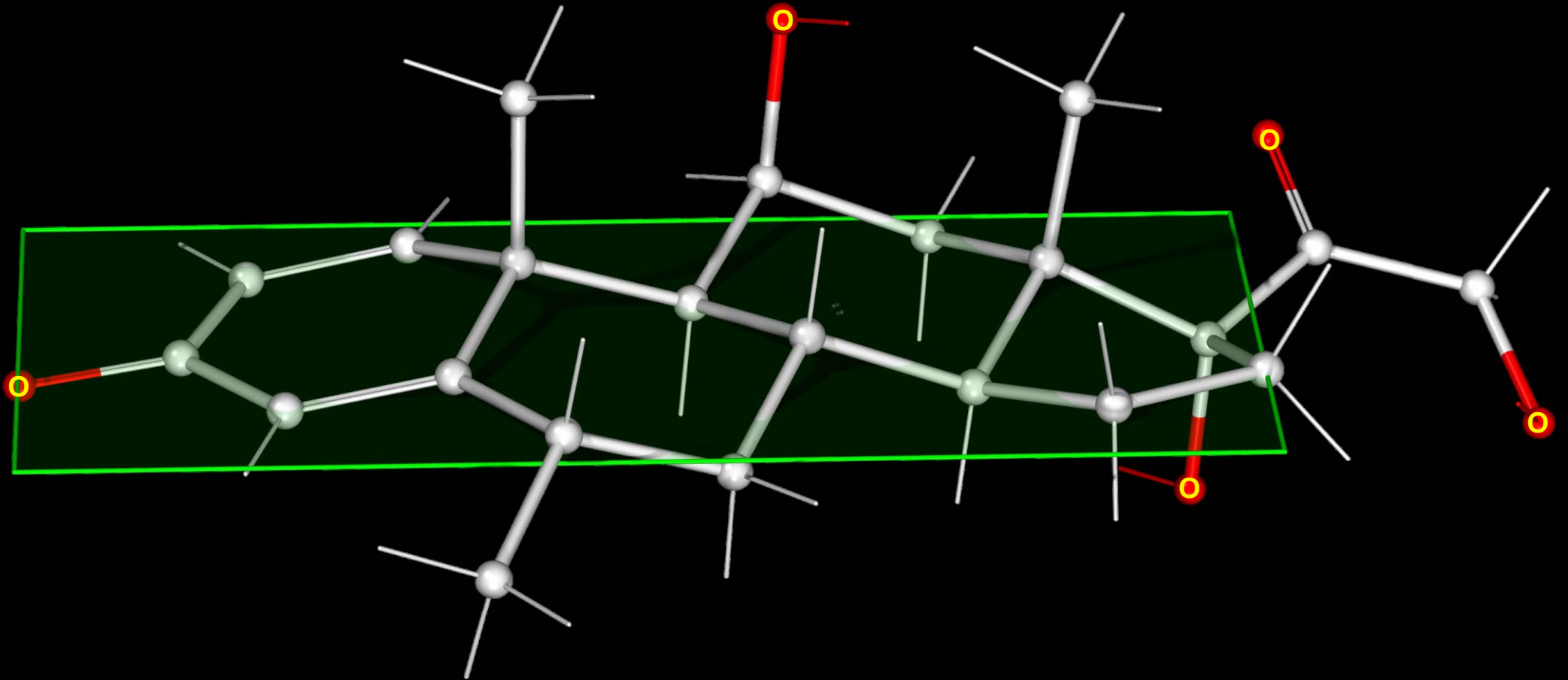
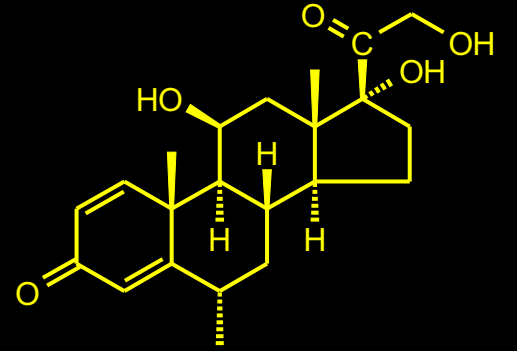
Optical Rotation: [α]_D²³ +123° (c = 0.64 in chloroform)

Absorption maximum: uv max (ethanol): 238 nm (ϵ 16800)

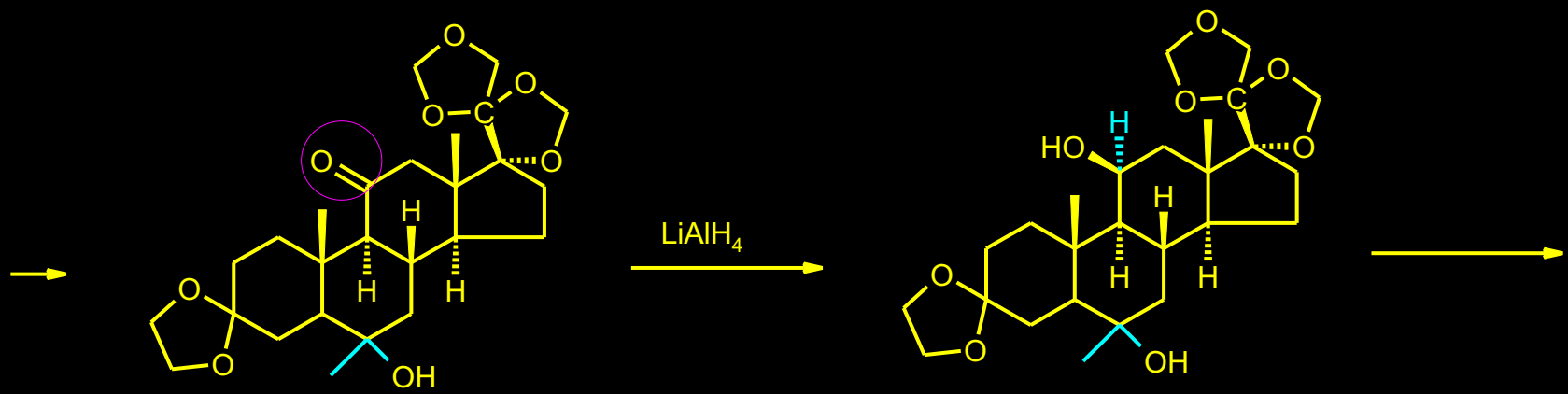
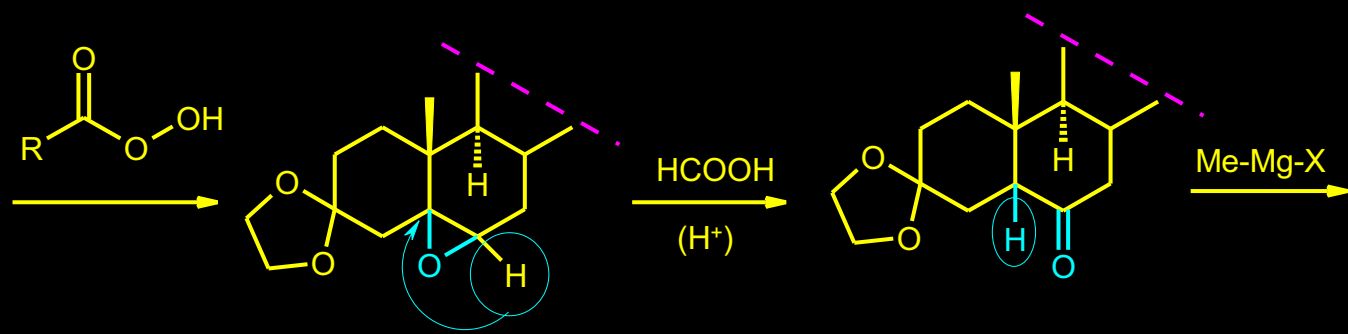
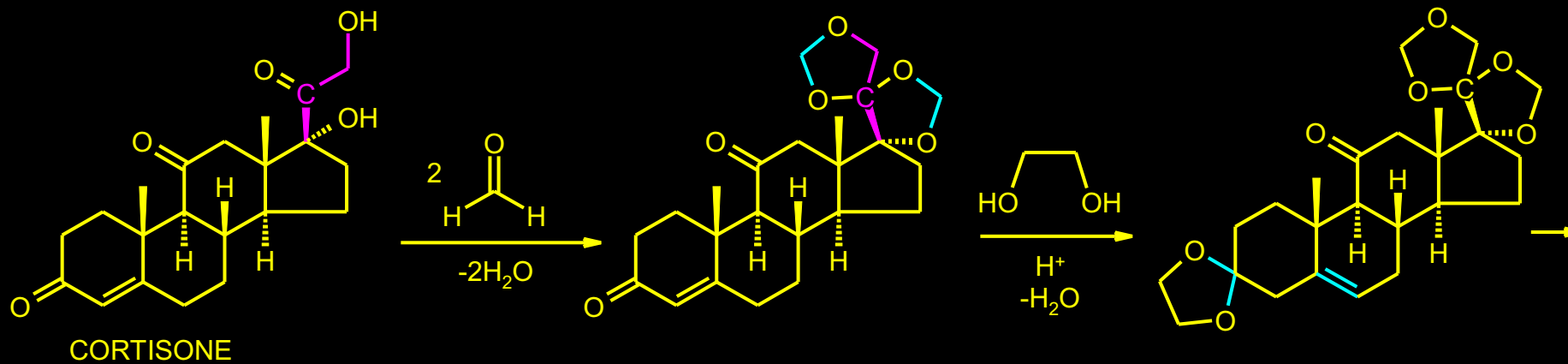
Therap-Cat: [Mineralocorticoid](#).

Therap-Cat-Vet: Mineralocorticoid.

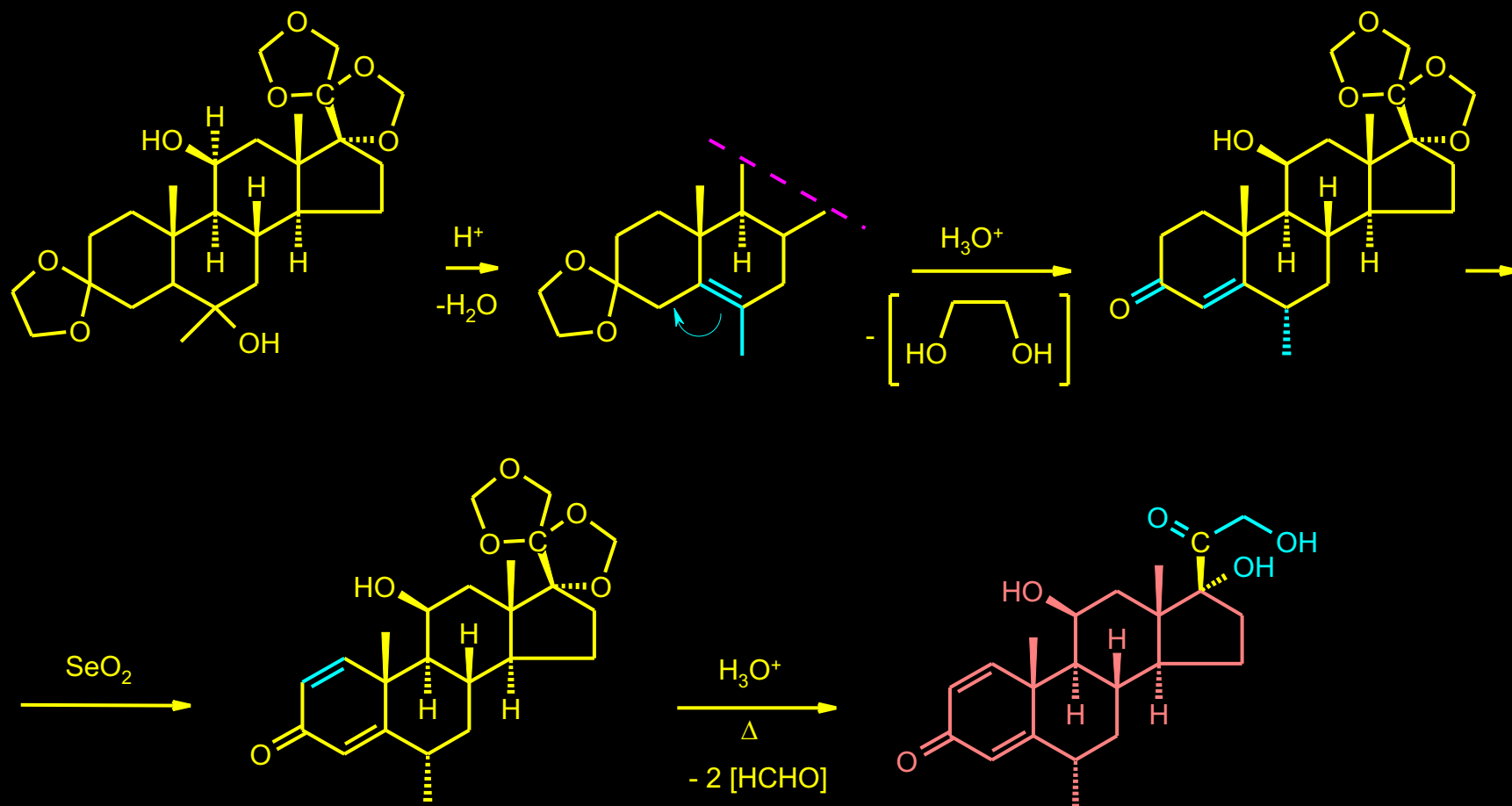
METHYLPREDNISOLONE (GLUCOCORTICOID)



SINTEZA METHYLPREDNISOLONE-a



SINTEZA METHYLPREDNISOLONE-a -nastavak



METHYLPREDNISOLONE

Monograph Number: 6133

Title: Methylprednisolone

CAS Registry Number: 83-43-2

CAS Name: (6 α ,11 β)-11,17,21-Trihydroxy-6-methylpregna-1,4-diene-3,20-dione

Additional Names: 1-dehydro-6 α -methylhydrocortisone; 1 α -6 α -methylhydrocortisone; 6 α -methyl-11 β ,17 β ,21-triol-1,4-pregnadiene-3,20-dione

Trademarks: Medrate (Pharmacia & Upjohn); Medrol (Pharmacia & Upjohn); Medrone (Pharmacia & Upjohn); Urbason (HMR)

Molecular Formula: C₂₂H₃₀O₅

Molecular Weight: 374.47.

Percent Composition: C 70.56%, H 8.07%, O 21.36%

Literature References: Prepn: Spero *et al.*, *J. Am. Chem. Soc.* **78**, 6213 (1956); Fried, *ibid.* **81**, 1235 (1959); Sebek, Spero, **US 2897218** (1959 to Upjohn); Gould, **US 3053832** (1962 to Schering). Review of clinical toxicology: J. D. Truwit, *Crit. Care Clinics* **7**, 639-657 (1991); of neuroprotective pharmacology: E. D. Hall, *J. Neurosurg.* **76**, 13-22 (1992); of pharmacokinetics and clinical efficacy in multiple sclerosis: O. R. Hommes *et al.*, *Mult. Scler.* **1**, 327-328 (1996). Clinical trial in acute spinal cord injury: M. B. Bracken *et al.*, *J. Neurosurg.* **89**, 699 (1998); in carpal tunnel syndrome: J. W. H. H. Dammers *et al.*, *Brit. Med. J.* **319**, 884 (1999).

Properties: Crystals, mp 228-237°. [α]_{D20} +83° (dioxane). uv max (95% ethanol): 243 nm (ϵ 14875). Sparingly sol in alcohol, dioxane, methanol; slightly sol in acetone, chloroform; very slightly sol in ether. Practically insol in water.

Melting point: mp 228-237°

Optical Rotation: [α]_{D20} +83° (dioxane)

Absorption maximum: uv max (95% ethanol): 243 nm (ϵ 14875)

Derivative Type: 21-Acetate

CAS Registry Number: 53-36-1

Trademarks: Depo-Medrate (Pharmacia & Upjohn); Depo-Medrol (Pharmacia & Upjohn); Depo-Medrone (Pharmacia & Upjohn); Vetacortyl (Stricker)

Molecular Formula: C₂₄H₃₂O₆

Molecular Weight: 416.51.

Percent Composition: C 69.21%, H 7.74%, O 23.05%

Properties: Crystals, mp 205-208°. [α]_{D20} +101° (dioxane). uv max (95% ethanol): 243 nm (ϵ 14825). Sol in dioxane; sparingly sol in acetone, alcohol, chloroform, methanol; slightly sol in ether. Practically insol in water.

Melting point: mp 205-208°

Optical Rotation: [α]_{D20} +101° (dioxane)

Absorption maximum: uv max (95% ethanol): 243 nm (ϵ 14825)

Derivative Type: 21-Succinate sodium salt

CAS Registry Number: 2375-03-3

Trademarks: Urbason Solubile (HMR); Solu-Medrol (Pharmacia & Upjohn)

Molecular Formula: C₂₆H₃₃NaO₈

Molecular Weight: 496.52.

Percent Composition: C 62.89%, H 6.70%, Na 4.63%, O 25.78%

Literature References: Prepn: Sebek, Spero, *loc. cit.*

Properties: White, or nearly white, odorless, hygroscopic, amorphous solid. Very sol in water, alcohol; very slightly sol in acetone. Insol in chloroform.

Derivative Type: Aceponate

CAS Registry Number: 86401-95-8

Trademarks: Advantan (Schering)

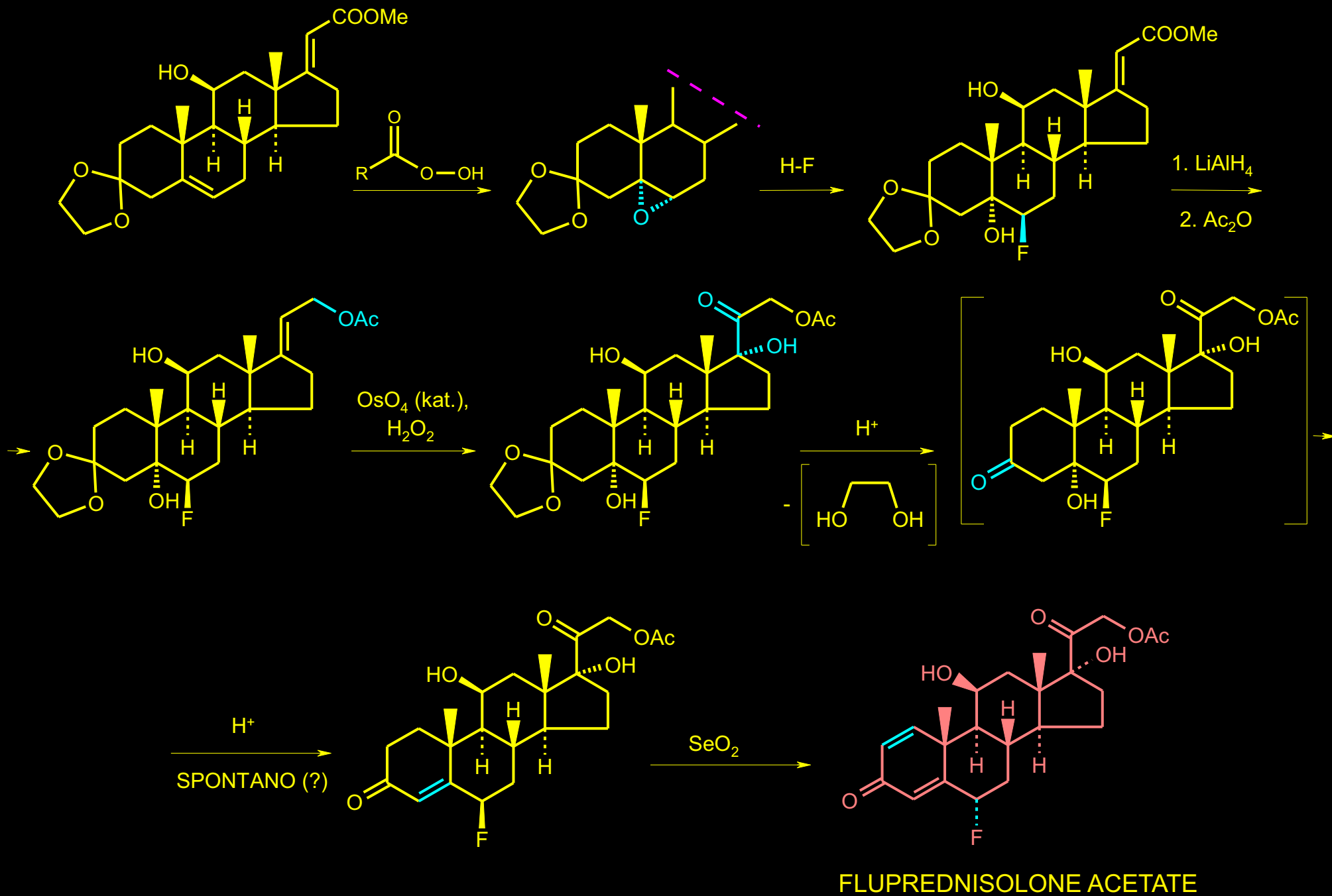
Molecular Formula: C₂₇H₃₆O₇

Molecular Weight: 472.57.

Percent Composition: C 68.62%, H 7.68%, O 23.70%

Therap-Cat: Glucocorticoid.

SINTEZA FLUPREDNISOLONE ACETATA (GLUCOCORTICOID)



FLUPREDNISOLONE ACETATE

Monograph Number: 4218

Title: Fluprednisolone

CAS Registry Number: 53-34-9

CAS Name: (6 α ,11 β)-6-Fluoro-11,17,21-trihydroxypregna-1,4-diene-3,20-dione

Additional Names: 6 α -fluoroprednisolone; 6 α -fluoro-1,4-pregnadiene-11 β ,17 β ,21-triol-3,20-dione; 6 α -fluoro-1-dehydrohydrocortisone

Manufacturers' Codes: U-7800; NSC-47439

Trademarks: Alphadrol (Upjohn); Etadrol (Farmitalia)

Molecular Formula: C₂₁H₂₇FO₅

Molecular Weight: 378.43.

Percent Composition: C 66.65%, H 7.19%, F 5.02%, O 21.14%

Literature References: Prepn: Hogg, Spero, **US 2841600** (1958 to Upjohn); Batres *et al.*, **DE 1079042** (1960 to Syntex); Lettré, Hotz, **DE 1088953** (1960 to Bayer).

Properties: Crystals, mp 208-213°. [α]_D +92°.

Melting point: mp 208-213°

Optical Rotation: [α]_D +92°

Derivative Type: 21-Acetate

Molecular Formula: C₂₃H₂₉FO₆

Molecular Weight: 420.47.

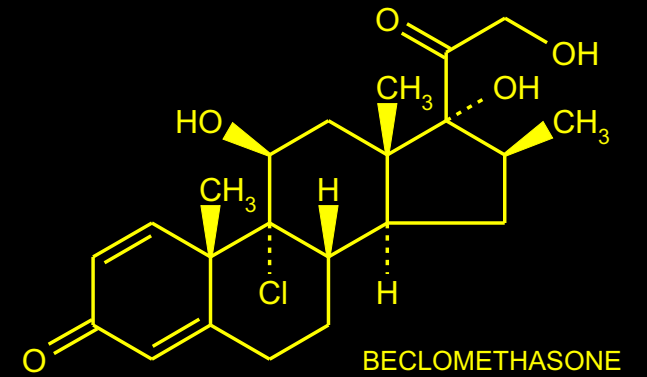
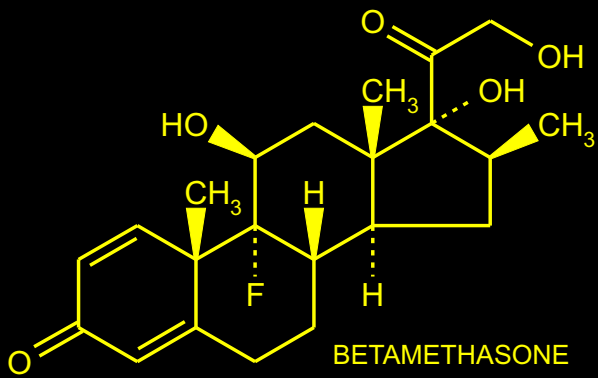
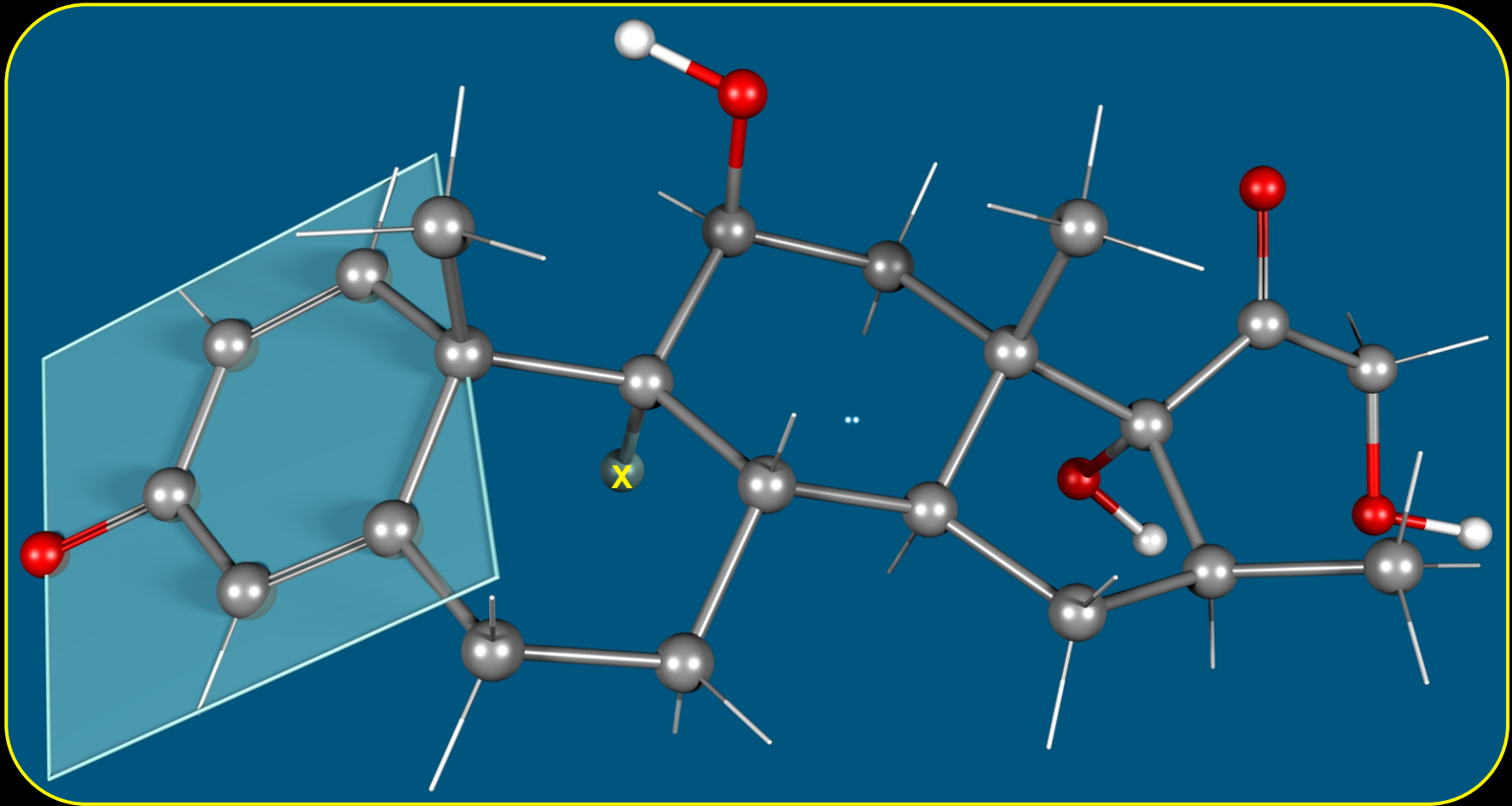
Percent Composition: C 65.70%, H 6.95%, F 4.52%, O 22.83%

Properties: Crystals, mp 235-238°.

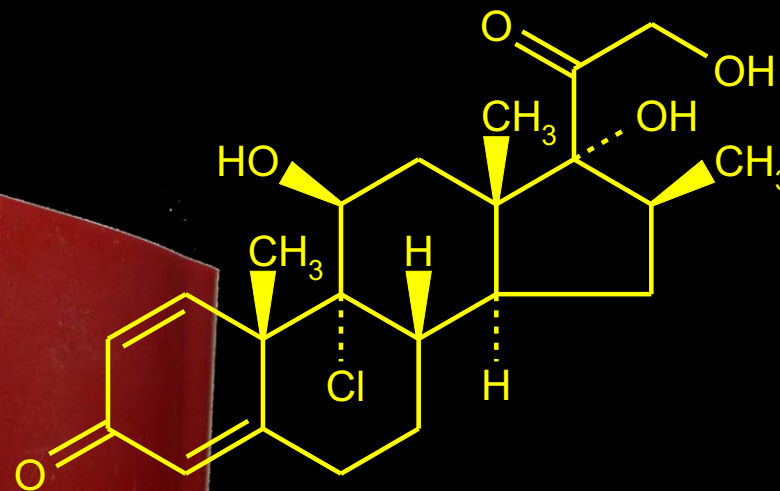
Melting point: mp 235-238°

Therap-Cat: [Glucocorticoid; anti-inflammatory.](#)

Therap-Cat-Vet: [Anti-inflammatory.](#)

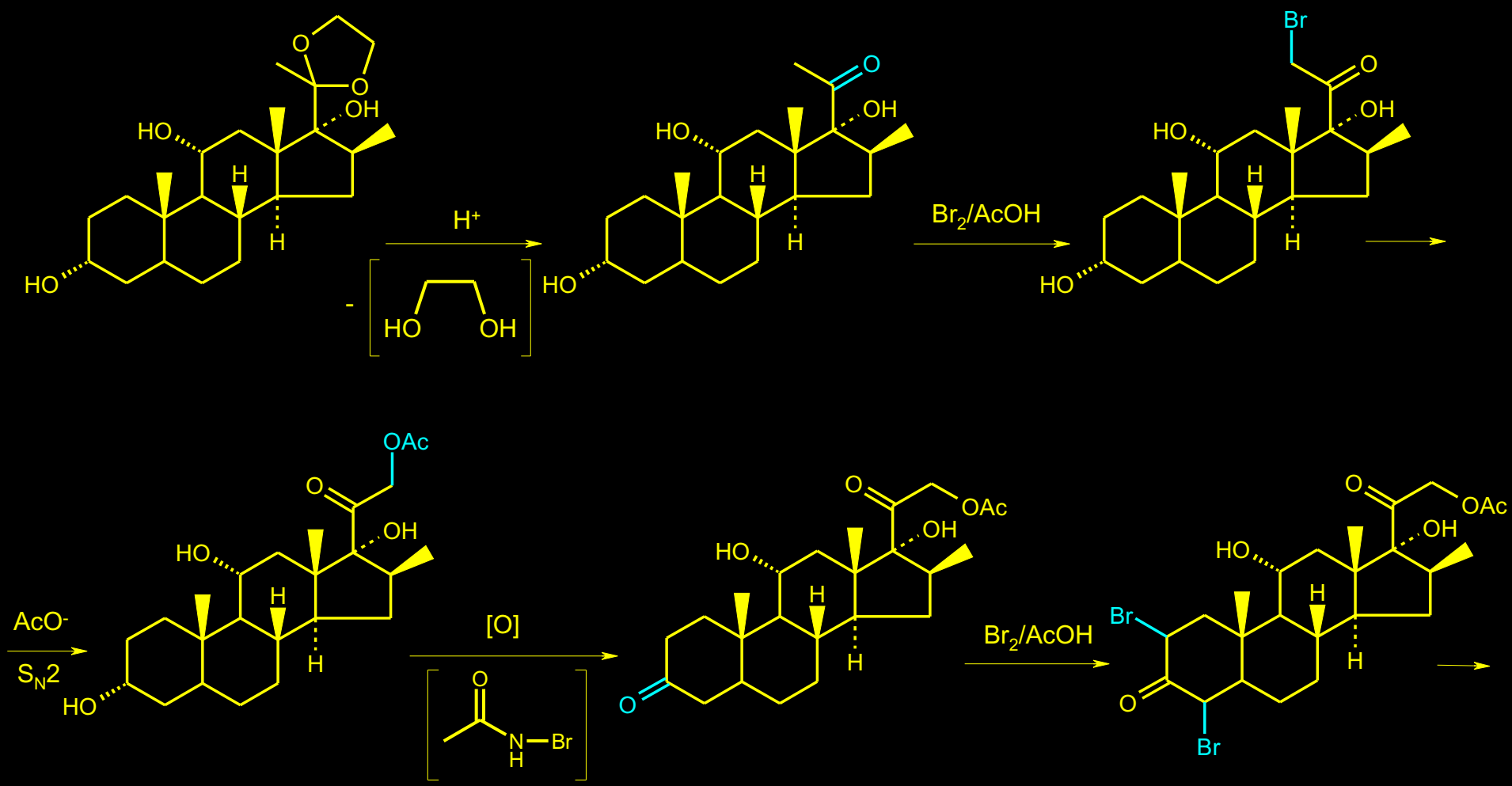


SPREJ ZA INHALACIJU (PROTIV NAPADA ASTME I ALERGIJSKIH REAKCIJA)

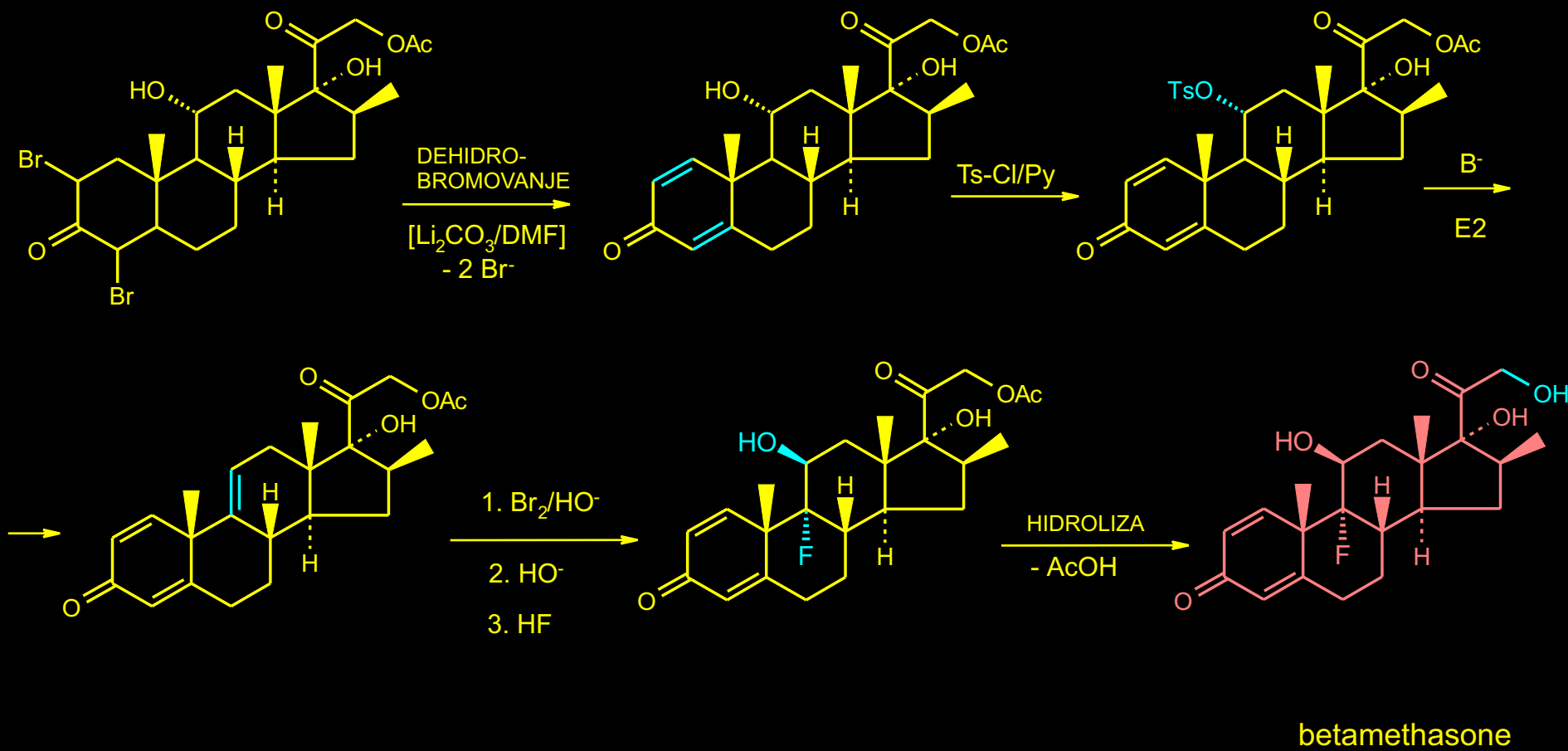


BECLOMETHASONE

SINTEZA BETAMETHASONE-a (GLUCOCORTICOID)



SINTEZA BETAMETHASONE-a -nastavak



Monograph Number: 1183

Title: BETAMETHASONE

CAS Registry Number: 378-44-9

CAS Name: (11 β ,16 α)-9-Fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione

Additional Names: 9 α -fluoro-16 α -methylprednisolone; 16 α -methyl-9 α -fluoro-11 β -hydrocortisone; 16 α -methyl-9 α -fluoroprednisolone; betadexamethasone; flubenisolone; -methasone

Manufacturers' Codes: Sch-4831; NSC-39470

Trademarks: beta-Corlan; Becort (Rachelle); Betasolon; Betnelan (Glaxo); Celestene (Schering); Celestone (Schering); Dermabet (Taro); Diprolene (Schering); Visubeta

Molecular Formula: C₂₂H₂₉FO₅

Molecular Weight: 392.46.

Percent Composition: C 67.33%, H 7.45%, F 4.84%, O 20.38%

Literature References: Prepn: Taub *et al.*, *J. Am. Chem. Soc.* **80**, 4435 (1958); Oliveto *et al.*, *ibid.* 6688; Taub *et al.*, *ibid.* **82**, 4012 (1960); **US 3053865** (1962 to Merck & Co.); Amiard *et al.*, **US 3104246** (1963 to Roussel-UCLAF). Also prepared from hecogenin. Comprehensive description of the dipropionate ester: M. G. Ferrante, B. C. Rudy, *Anal. Profiles Drug Subs.* **6**, 43-60 (1977).

Properties: Crystals from ethyl acetate, mp 231-234° (dec). [α]_D +108° (acetone). uv max (methanol): 238 nm (ϵ 15200).

Melting point: mp 231-234° (dec)

Optical Rotation: [α]_D +108° (acetone)

Absorption maximum: uv max (methanol): 238 nm (ϵ 15200)

Derivative Type: 21-Acetate

CAS Registry Number: 987-24-6

Trademarks: Betafluorene (Lepetit); Celestovet (Biokema)

Molecular Formula: C₂₄H₃₁FO₆

Molecular Weight: 434.50.

Percent Composition: C 66.34%, H 7.19%, F 4.37%, O 22.09%

Properties: Hexagonal prisms from acetone + ether, mp 205-208° (Taub); also reported as mp 196-201° (Oliveto). [α]_D +140° (chloroform). uv max (methanol): 238 nm (ϵ 14800).

Melting point: mp 205-208° (Taub); mp 196-201° (Oliveto)

Optical Rotation: [α]_D +140° (chloroform)

Absorption maximum: uv max (methanol): 238 nm (ϵ 14800)

Derivative Type: 17-Benzoate

CAS Registry Number: 22298-29-9

Manufacturers' Codes: W-5975

Trademarks: Bebate; Beben (Warner-Lambert); Benisone (Warner-Chilcott); Euvaderm (Gödecke); Flurobate (Texas Pharmacal); Parbetan (Parke-Davis); Uticort (Parke-Davis)

Molecular Formula: C₂₉H₃₃FO₆

Molecular Weight: 496.57.

Percent Composition: C 70.14%, H 6.70%, F 3.83%, O 19.33%

Properties: Crystals from acetone-ether, mp 225-228°. [α]_{D24} +63.5° (dioxane). Synthesis and activity: Ercoli *et al.*, *J. Med. Chem.* **15**, 783 (1972). See also Cullen, *Curr. Ther. Res.* **15**, 243 (1973).

Melting point: mp 225-228°

Optical Rotation: [α]_{D24} +63.5° (dioxane)

Derivative Type: 17,21-Dipropionate

CAS Registry Number: 5593-20-4

Manufacturers' Codes: Sch-11460

Trademarks: Diproderm (Schering); Diprophos (Schering); Diprosis (Essex); Diprosone (Schering); Maxivate (Westwood); Rinderon-DP (Shionogi)

Molecular Formula: C₂₈H₃₇FO₇

Molecular Weight: 504.59.

Percent Composition: C 66.65%, H 7.39%, F 3.77%, O 22.20%

Properties: Powder, mp 170-179° (dec). [α]_{D26} +65.7° (dioxane). uv max (methanol): 238 nm (ϵ 15700).

Melting point: mp 170-179° (dec)

Optical Rotation: [α]_{D26} +65.7° (dioxane)

Absorption maximum: uv max (methanol): 238 nm (ϵ 15700)

Derivative Type: 17-Valerate

CAS Registry Number: 2152-44-5

Trademarks: Bedermin (Damor); Betnesol-V (Glaxo); Betneval (Glaxo); Betnovate (Glaxo); Bextasol (Glaxo); Celestan-V (Essex); Celestoderm-V (Schering); Dermosol (Iwaki); Dermovaleas (Valeas); Ecoval 70; Hormezon (Tobishi); Tokuderm (Nichiban); Valisone (Schering)

Molecular Formula: C₂₇H₃₇FO₆

Molecular Weight: 476.58.

Percent Composition: C 68.05%, H 7.82%, F 3.99%, O 20.14%

Properties: Needles from acetone + petr ether, mp 183-184°. [α]_D +77° (dioxane). uv max: 239 nm (ϵ 15920). **NL 6406615** (1964 to Glaxo).

Melting point: mp 183-184°

Optical Rotation: [α]_D +77° (dioxane)

Absorption maximum: uv max: 239 nm (ϵ 15920)

Derivative Type: 21-Phosphate disodium salt

CAS Registry Number: 151-73-5

Additional Names: Betamethasone 21-(dihydrogen phosphate) disodium salt

Trademarks: Bentelan (Glaxo); Betnesol (Glaxo); Celestan (Essex); Durabetason (Durachemie); Vista-Methasone (Richard Daniel)

Molecular Formula: C₂₂H₂₈FNa₂O₈P

Molecular Weight: 516.40.

Therap-Cat: Glucocorticoid.

Monograph Number: 1020

Title: [Beclomethasone](#)

CAS Registry Number: 4419-39-0

CAS Name: (11 β ,16 α)-9-Chloro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione

Additional Names: 9 β -chloro-16 α -methyl-1,4-pregnadiene-11 β ,17 α ,21-triol-3,20-dione; 9 β -chloro-16 α -methylprednisolone

Molecular Formula: C₂₂H₂₉ClO₅

Molecular Weight: 408.92.

Percent Composition: C 64.62%, H 7.15%, Cl 8.67%, O 19.56%

Literature References: Glucocorticoid. Prepn of free alcohol and 21-acetate: **GB 912378** (1962 to Merck & Co.); of 21-acetate: **GB 901093** (1962 to Schevico); of mono and diesters: J. Elks *et al.*, **BE 649170**; *idem*, **US 3312590** (1964, 1967 both to Glaxo). Symposium on clinical studies: *Brit. J. Clin. Pharmacol.* **4**, Suppl. 3, 249S-312S (1977). Use in chronic asthma in children: M. Rao *et al.*, *J. Asthma* **19**, 21 (1982); in treatment of asthma in steroid-independent adults: V. A. Malfitan, *Clin. Ther.* **4**, 472 (1982). Review of use in rhinitis: P. Small *et al.*, *Ann. Allergy* **49**, 127 (1982); of pharmacology, side effects and use in asthma and allergic rhinitis: R. N. Brogden *et al.*, *Drugs* **28**, 99-126 (1984).

Derivative Type: Dipropionate

CAS Registry Number: 5534-09-8

Manufacturers' Codes: Sch-18020W

Trademarks: Aerobec (3M Pharma); Aldecin (Schering); Anceron (Schering); Andion (Gea); Beclacin (Kaigai); Becloforte (Allen & Hanburys); Beclomet (Orion);

Beclorhinol (Lindopharm); Beclovent (Glaxo Wellcome); Becodisks (Allen & Hanburys); Beconase (Glaxo Wellcome); Beconasol (Glaxo Wellcome); Becotide (Allen & Hanburys); Clenil-A (Chiesi); Entyderma (Taiyo); Inalone (Lampugnani); Korbutone (Nippon Glaxo); Propaderm (Glaxo Wellcome); Qvar (3M); Rino-Clenil (Chiesi); Sanasthmax (Glaxo Wellcome); Sanasthmyl (Glaxo Wellcome); Vancenase (Schering); Vanceril (Schering); Viarex (Schering); Viarox (Byk-Gulden)

Molecular Formula: C₂₈H₃₇ClO₇

Molecular Weight: 521.05.

Percent Composition: C 64.54%, H 7.16%, Cl 6.80%, O 21.49%

Properties: Crystals from acetone + ether, mp 117-120° (dec). [α]_D +98.0° (c = 1.0 in dioxane). uv max (ethanol): 238 nm (ε 15990).

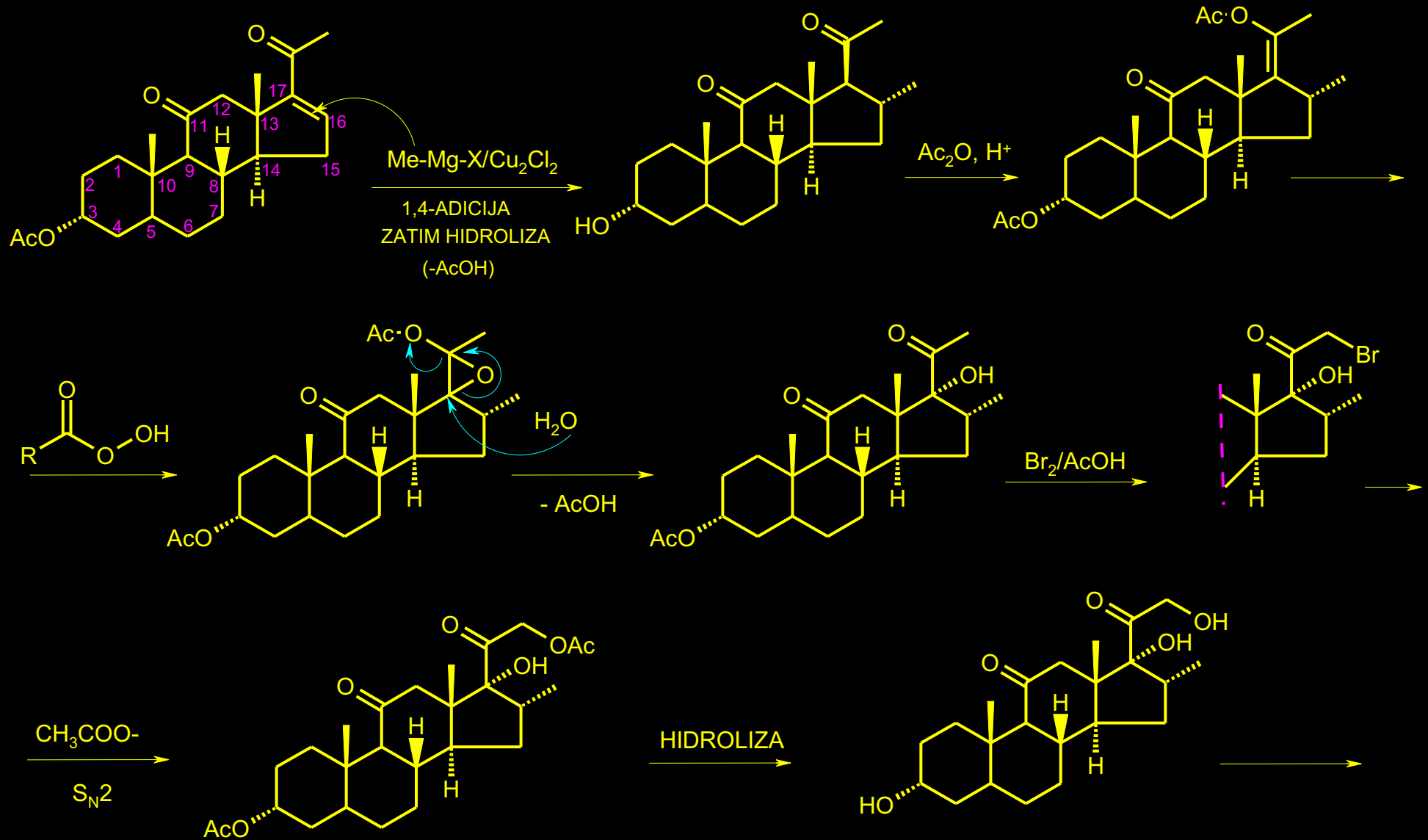
Melting point: mp 117-120° (dec)

Optical Rotation: [α]_D +98.0° (c = 1.0 in dioxane)

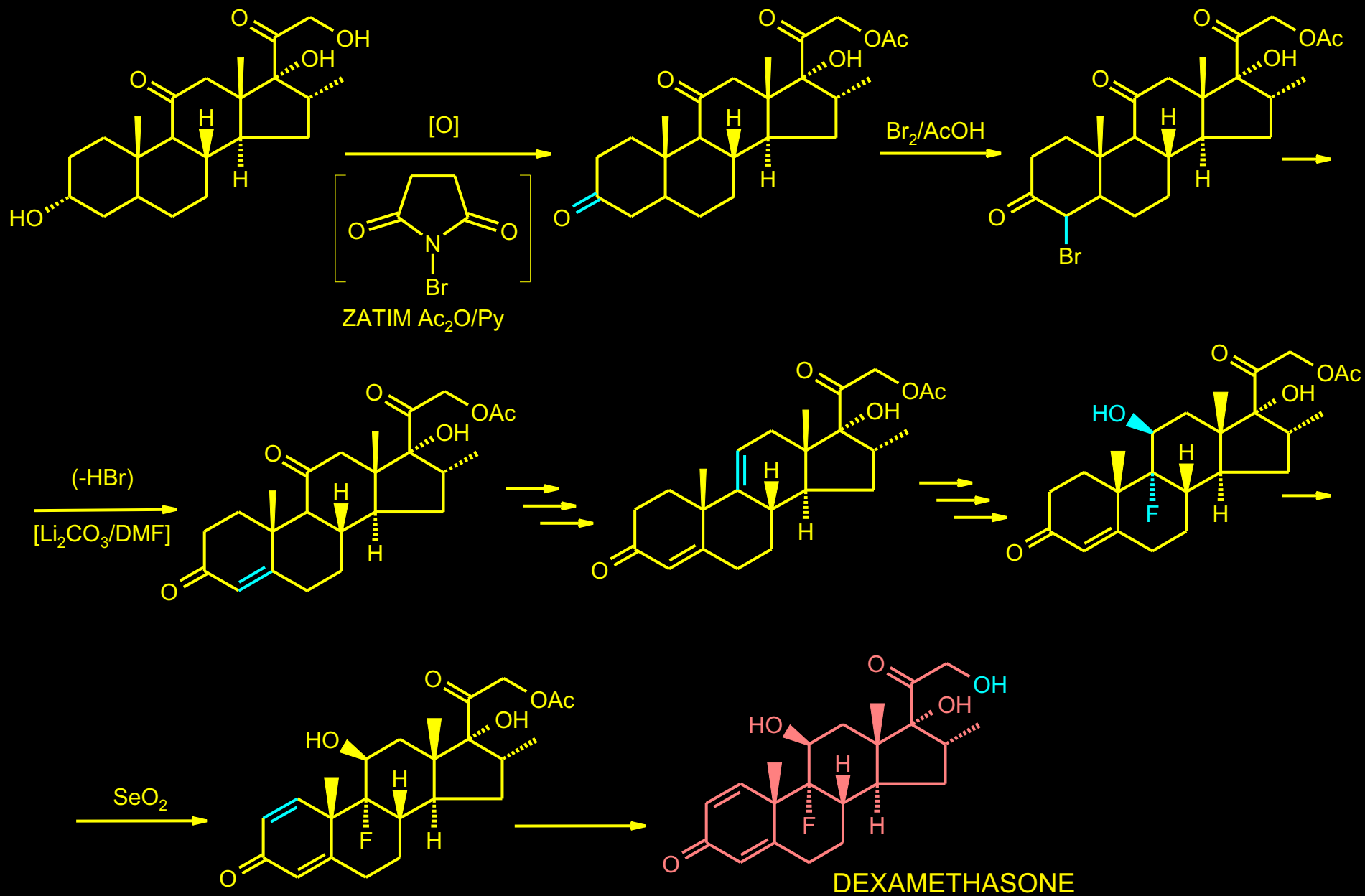
Absorption maximum: uv max (ethanol): 238 nm (ε 15990)

Therap-Cat: [Antiallergic](#), [antiasthmatic \(inhalant\)](#). [Anti-inflammatory \(topical\)](#).

SINTEZA DEXAMETHASONE-a (GLUCOCORTICOID; ANTI-INFLAMMATORY)



SINTEZA DEXAMETHASONE-a -nastavak



Monograph Number: 2960

Title: [Dexamethasone](#)

CAS Registry Number: 50-02-2

CAS Name: (11 β ,16 α)-9-Fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione

Additional Names: 9 α -fluoro-16 α -methylprednisolone; 16 α -methyl-9 α -fluoro-1,4-pregnadiene-11 β ,17 β ,21-triol-3,20-dione; 16 α -methyl-9 α -fluoroprednisolone; 1-dehydro-16 α -methyl-9 α -fluorohydrocortisone; 16 α -methyl-9 α -fluoro- β -hydrocortisone; hexadecadrol

Trademarks: Aeroseb-Dex (Herbert); Corson (Takeda); Cortisumman (Winzer); Decacort (F.C.F.); Decaderm (Merck & Co.); Decadron (Merck & Co.); Decalix (Pharmed); Decasone (Frosst); Dekacort (Farber-Ref); Deltafluorene (Lepetit); Deronil (Schering); Deseronil (SCA); Dexacortal (Organon); Dexacortin (Streuli); Dexafarma (Llano); Dexa-Mamallet (Showa); Dexameth (USV); Dexamonozon (Medice); Dexapos (Ursapharm); Dexa-sine (Alcon-Thilo); Dexasone (ICN); Dexinoral (Desitin); Dinormon (Lusofarmaco); Fluormone (Benvegna); Fortecortin (Merck KGaA); Isopto-Dex (Alcon); Lokalison F (Dorsch); Loverine (Isei); Luxazone (Allergan); Maxidex (Alcon); Pet-Derm III (Pfizer)

Molecular Formula: C₂₂H₂₉FO₅

Molecular Weight: 392.46.

Percent Composition: C 67.33%, H 7.45%, F 4.84%, O 20.38%

Literature References: Prepn: Arth *et al.*, *J. Am. Chem. Soc.* **80**, 3161 (1958); Oliveto *et al.*, *ibid.* 4431; Muller *et al.*, **US 3007923** (1961 to Lab. Franc. Chimiothér.); Arth *et al.*, **DE 1113690** (1961 to Merck & Co.); **GB 869511** (to Upjohn). Pharmacology in guinea pigs: L. Zicha *et al.*, *Arzneimittel-Forsch.* **10**, 831 (1960). Clinical trial of anti-emetic efficacy in chemotherapy-induced nausea: M. Markman *et al.*, *N. Engl. J. Med.* **311**, 549 (1984); in combination with ondansetron, *q.v.*: F. Roila *et al.*, *ibid.* **342**, 1554 (2000). Use as diagnostic aid in depression: B. J. Carroll *et al.*, *Arch. Gen. Psychiat.* **38**, 15 (1981); P. P. Hubain *et al.*, *Neuropsychobiology* **16**, 57 (1986); M. Ansseau *et al.*, *ibid.* 68. Comprehensive description: E. M. Cohen, *Anal. Profiles Drug Subs.* **2**, 163-197 (1973). Reviews of diagnostic use in Cushing's syndrome: L. Crapo, *Metabolism* **28**, 955 (1979); in depression: L. Braddock, *Brit. J. Psychiat.* **148**, 363 (1986).

Properties: Crystals from ether, mp 262-264°; mp 268-271° (Arth, 1961). [α]_D²⁵ +77.5° (dioxane). Soly in water (25°): 10 mg/100 ml. Sol in acetone, ethanol, chloroform.

Melting point: mp 262-264°; mp 268-271° (Arth, 1961)

Optical Rotation: [α]_D²⁵ +77.5° (dioxane)

Derivative Type: 21-Acetate

CAS Registry Number: 1177-87-3

Trademarks: Decadronal (Merck & Co.); Decadron-LA (Merck & Co.); Dectancyl (Roussel Diamant); Dexacortisyl (Hoechst)

Molecular Formula: C₂₄H₃₁FO₆

Molecular Weight: 434.50.

Percent Composition: C 66.34%, H 7.19%, F 4.37%, O 22.09%

Properties: Crystals, mp 215-221° (Arth, 1958); mp 229-231° (Oliveto); mp 238-240° (Arth, 1961). [α]_D²⁵ +73° (chloroform) (Arth, 1958); [α]_D +77.6° (Oliveto). uv max: 239 nm (ϵ 14900).

Melting point: mp 215-221° (Arth, 1958); mp 229-231° (Oliveto); mp 238-240° (Arth, 1961)

Optical Rotation: [α]_D²⁵ +73° (chloroform) (Arth, 1958); [α]_D +77.6° (Oliveto)

Absorption maximum: uv max: 239 nm (ϵ 14900)

Derivative Type: 21-(3,3-Dimethylbutyrate)

Additional Names: Dexamethasone *tert*-butylacetate

Trademarks: Decadron TBA (Merck & Co.)

Molecular Formula: C₂₈H₃₉FO₆

Molecular Weight: 490.60.

Percent Composition: C 68.55%, H 8.01%, F 3.87%, O 19.57%

Derivative Type: 21-Phosphate disodium salt

CAS Registry Number: 2392-39-4

Additional Names: Dexamethasone 21-(dihydrogen phosphate) disodium salt; dexamethasone sodium phosphate

Trademarks: Ak-Dex (Akorn); Baldex (Bausch & Lomb); Colvasone (Norbrook); Dalalone (Forest); Dexabene (Merckle); Dezone (Reid-Powell); Hexadrol (Organon); Oradexon (Organon); Orgadrone (Sankyo); Solu-Decadron (Merck & Co.); Soldesam (Pharmacologico)

Molecular Formula: C₂₂H₂₈FNa₂O₈P

Molecular Weight: 516.40.

Percent Composition: C 51.17%, H 5.46%, F 3.68%, Na 8.90%, O 24.79%, P 6.00%

Literature References: Used as an injectable form of dexamethasone. Prepn: Chemerda *et al.*, **US 2939873** (1960 to Merck & Co.); Irmscher, *Chem. & Ind. (London)* **1961**, 1035.

Properties: Crystals, mp 233-235°. [α]_D +57° (water). Also reported as [α]_D²⁵ +74 ±4° (calcd on water-free and alcohol-free basis, concn of 10 mg/ml): *USP XIX*, p 124. uv max (ethanol): 238-239 nm (ϵ 14000). Sol in water.

Melting point: mp 233-235°

Optical Rotation: [α]_D +57° (water); [α]_D²⁵ +74 ±4° (calcd on water-free and alcohol-free basis, concn of 10 mg/ml): *USP XIX*, p 124

Absorption maximum: uv max (ethanol): 238-239 nm (ϵ 14000)

Derivative Type: 17,21-Dipropionate

Manufacturers' Codes: THS-101

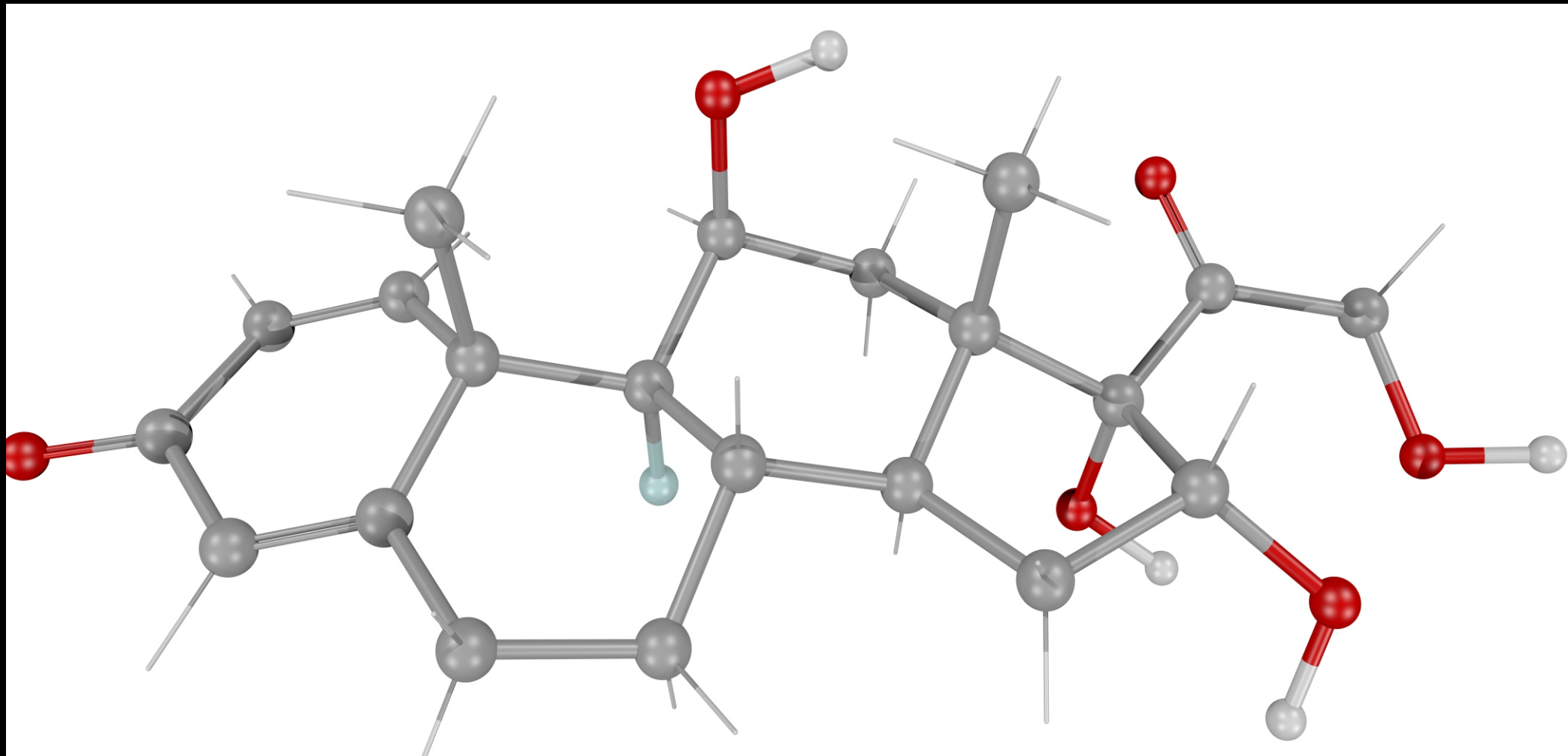
Trademarks: Methaderm (Taiho)

Molecular Formula: C₂₈H₃₇FO₇

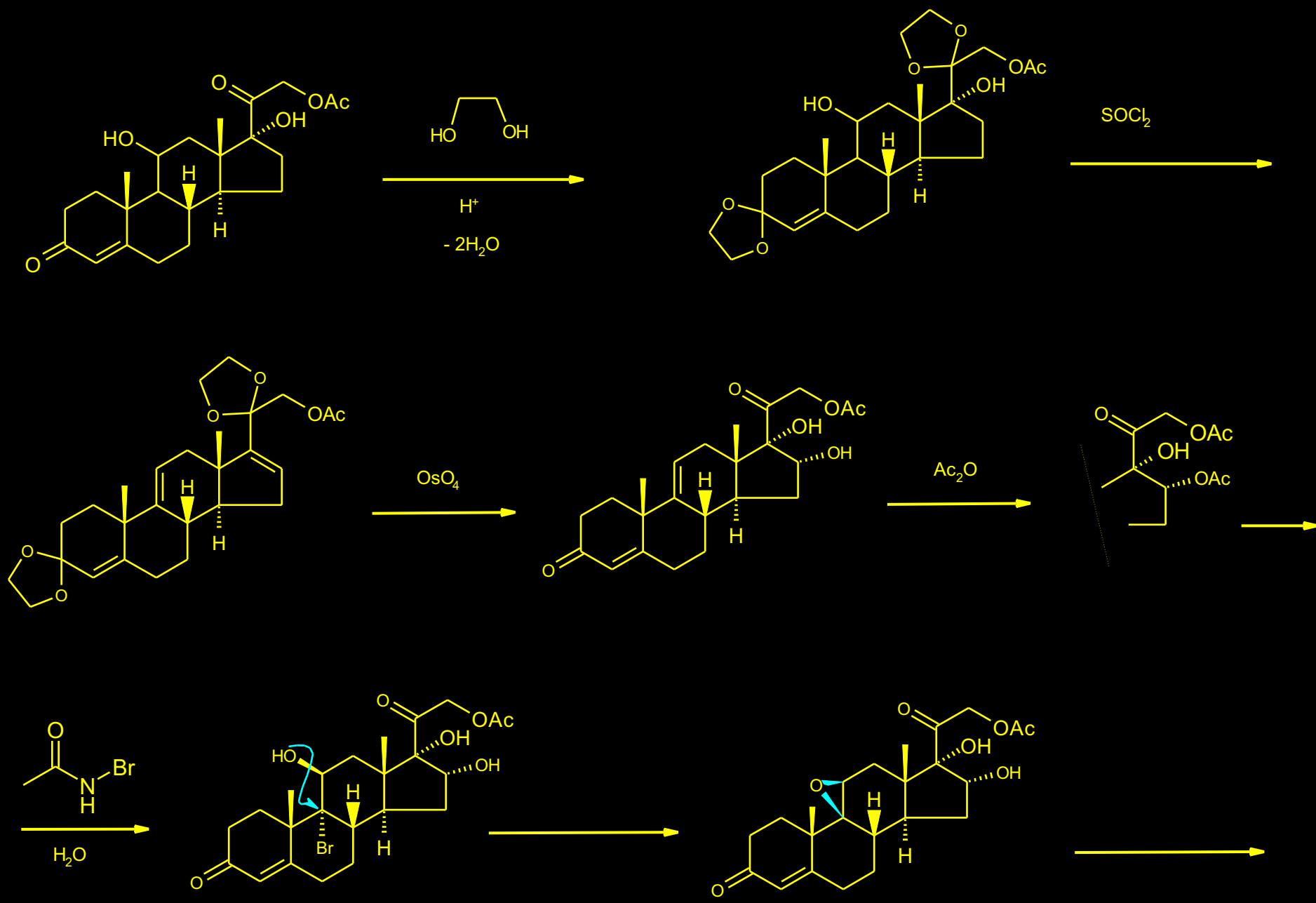
Therap-Cat: [Glucocorticoid](#); [anti-inflammatory](#). Diagnostic aid (Cushing's syndrome, depression).

Therap-Cat-Vet: [Glucocorticoid](#); [anti-inflammatory](#).

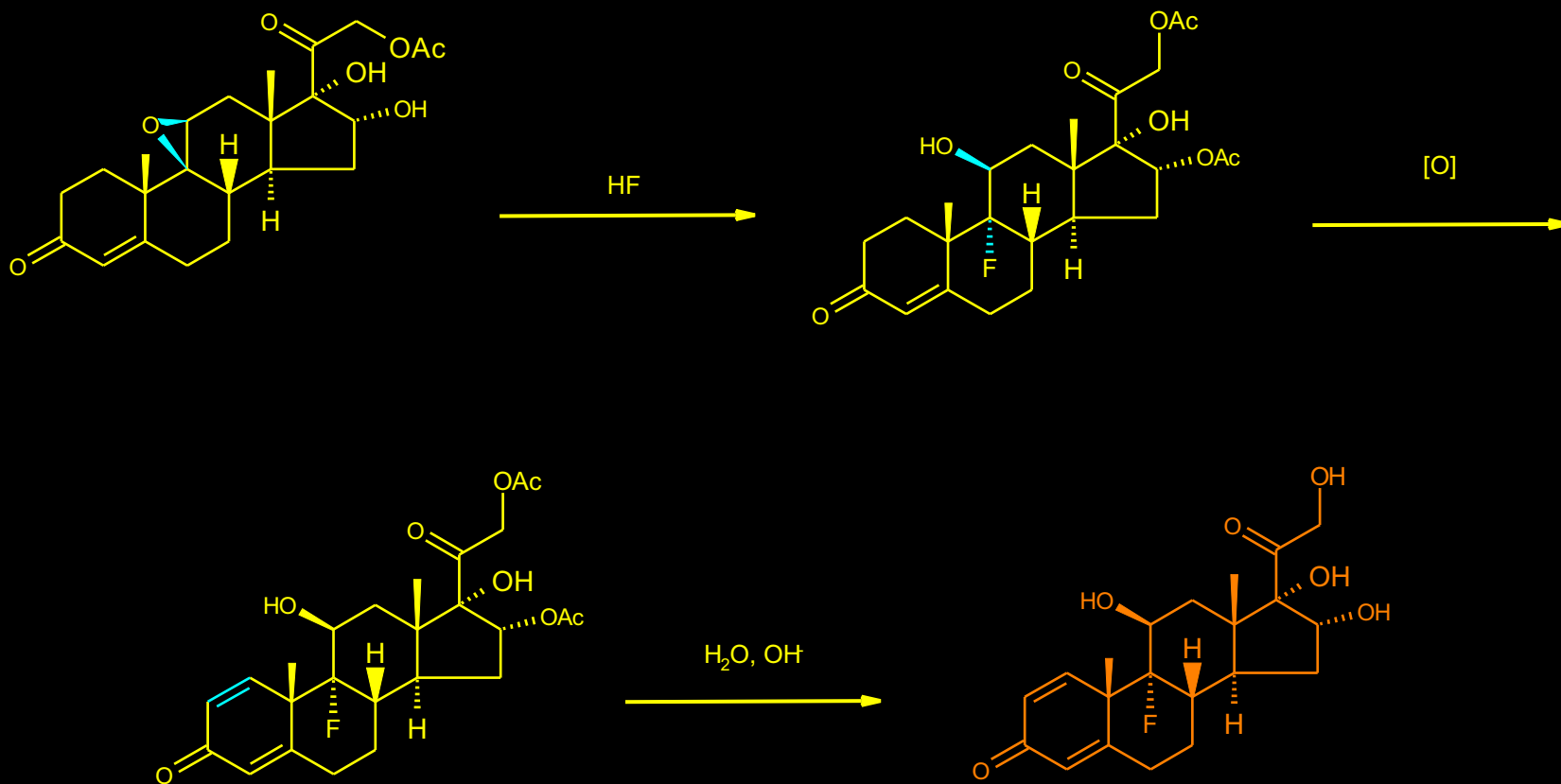
TRIAMCINOLONE (Glucocorticoid)



SINTEZA TRIAMCINOLONE-a:



SINTEZA TRIAMCINOLONE-a - nastavak



Monograph Number: 9670

Title: Triamcinolone

CAS Registry Number: 124-94-7

CAS Name: (11 β , 16 α)-9-Fluoro-11,16,17,21-tetrahydroxypregna-1,4-diene-3,20-dione

Additional Names: 1-9 α -fluoro-16 β -hydroxyhydrocortisone; 9 α -fluoro-16 β -hydroxyprednisolone; 1-16 α -hydroxy-9 α -fluorohydrocortisone; 16 α -hydroxy-9 α -fluoroprednisolone

Manufacturers' Codes: CL-19823

Trademarks: Aristocort (Lederle); Kenacort (Bristol-Myers Squibb); Ledercort (tabl.) (Lederle); Omcilon (Bristol-Myers Squibb); Tricortale (Bergamon); Volon (Bristol-Myers Squibb)

Molecular Formula: C₂₁H₂₇FO₆

Molecular Weight: 394.43.

Percent Composition: C 63.95%, H 6.90%, F 4.82%, O 24.34%

Literature References: Prepn: Bernstein *et al.*, *J. Am. Chem. Soc.* **78**, 5693 (1956); **81**, 1689 (1959); Thoma *et al.*, *ibid.* **79**, 4818 (1957); Bernstein *et al.*, Allen *et al.*, **US 2789118**; **US 3021347** (1957, 1962, both to Am. Cyanamid). Comprehensive description: K. Florey, *Anal. Profiles Drug Subs.* **1**, 367-396, 423-442 (1972); D. H. Sieh, *ibid.* **11**, 593-614, 651-661 (1982).

Properties: Crystals, mp 269-271°. mp also reported as 260-262.5°. [α]_D²⁵ +75° (acetone). uv max: 238 nm (ϵ 15800).

Melting point: mp 269-271°; mp also reported as 260-262.5°

Optical Rotation: [α]_D²⁵ +75° (acetone)

Absorption maximum: uv max: 238 nm (ϵ 15800)

Derivative Type: 16,21-Diacetate

CAS Registry Number: 67-78-7

CAS Name: (11 β , 16 α)-16,21-Bis(acetyloxy)-9-fluoro-11,17-dihydroxypregna-1,4-diene-3,20-dione

Additional Names: 16 α , 21-diacetoxy-9 α -fluoro-11 β , 17 β -dihydroxy-1,4-pregnadiene-3,20-dione

Trademarks: Cenocort (Central Pharm.); CINO-40 (Tutag); Tracilon (Savage)

Molecular Formula: C₂₅H₃₁FO₈

Molecular Weight: 478.51.

Percent Composition: C 62.75%, H 6.53%, F 3.97%, O 26.75%

Properties: Solvated crystals, mp 186-188° (with effervescence, mp 235° after drying). [α]_D²⁵ +22° (chloroform). uv max: 239 nm (ϵ 15200).

Melting point: Solvated crystals, mp 186-188° (with effervescence, mp 235° after drying)

Optical Rotation: [α]_D²⁵ +22° (chloroform)

Absorption maximum: uv max: 239 nm (ϵ 15200)

Therap-Cat: Glucocorticoid.

Therap-Cat-Vet: Glucocorticoid.