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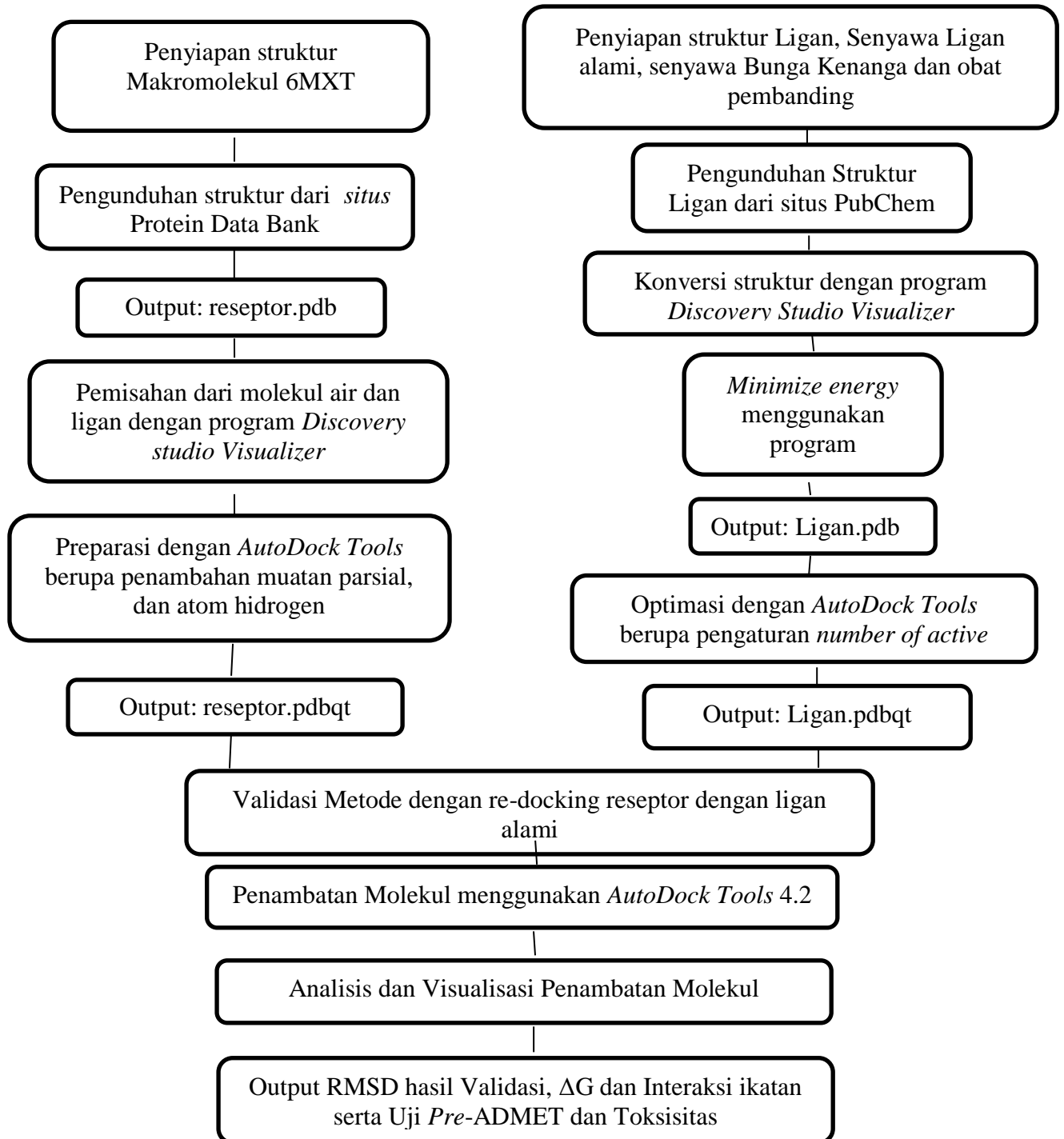
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LAMPIRAN 1

ALUR PENELITIAN

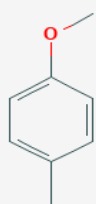


Gambar V.1 Alur penelitian

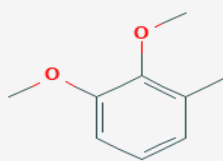
LAMPIRAN 2**TANAMAN BUNGA KENANGA (*Canangium odorata*(Lam) hook.F. & Thomson)**

Gambar V.2 Tanaman bunga kenanga

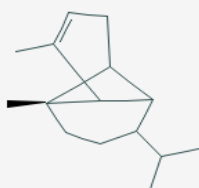
LAMPIRAN 3
SENYAWA BUNGA KENANGA



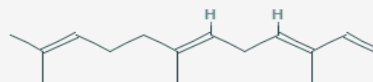
1-methoxy-4-methylbenzene



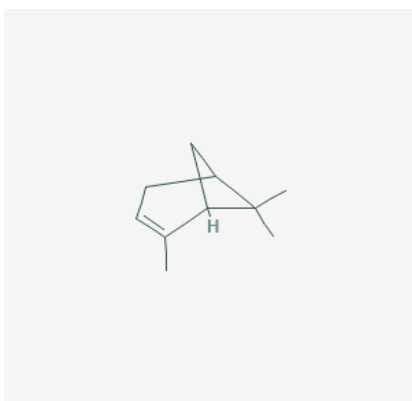
2,3-dimethoxytoluene



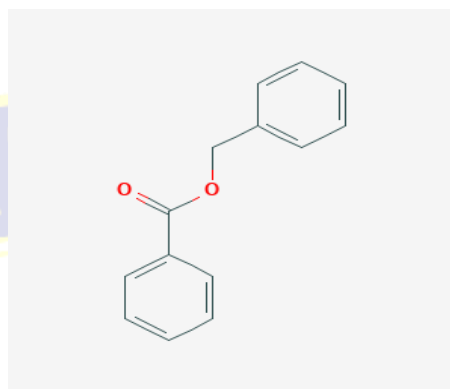
Alpha copaene



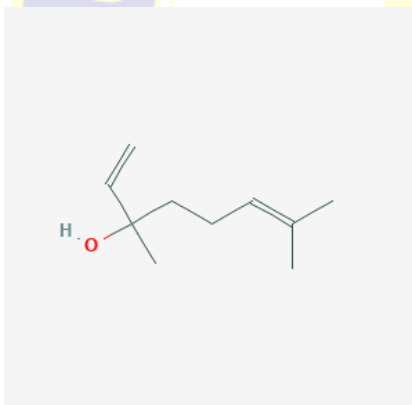
Alpha farnesene

LAMPIRAN 3**LANJUTAN 1**

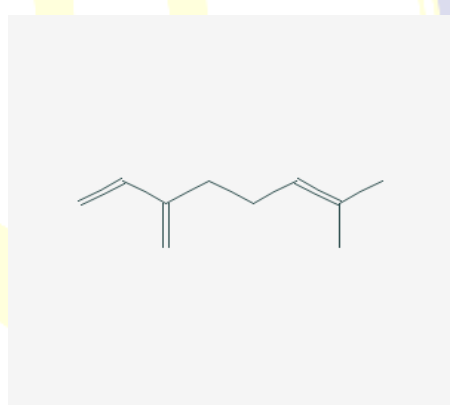
Alpha pinene



Benzyl benzoate



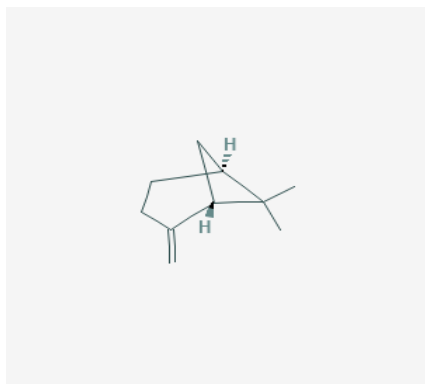
Beta linalool



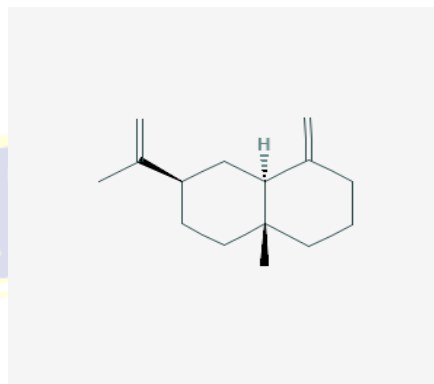
Beta myrcene

LAMPIRAN 3

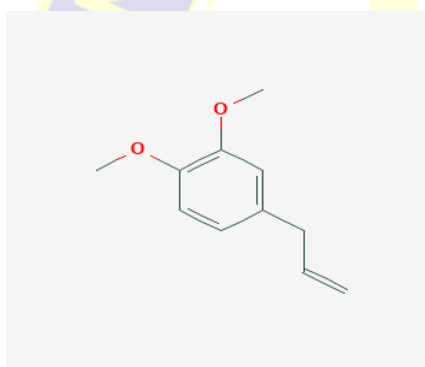
LANJUTAN 2



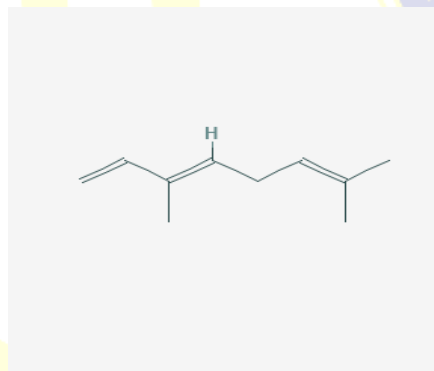
Beta pinene



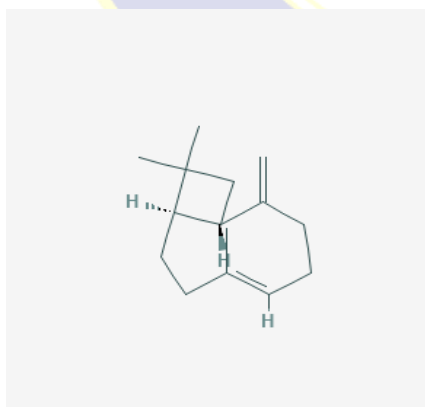
Beta silenene



Methyleugenol



Transbetaocimene

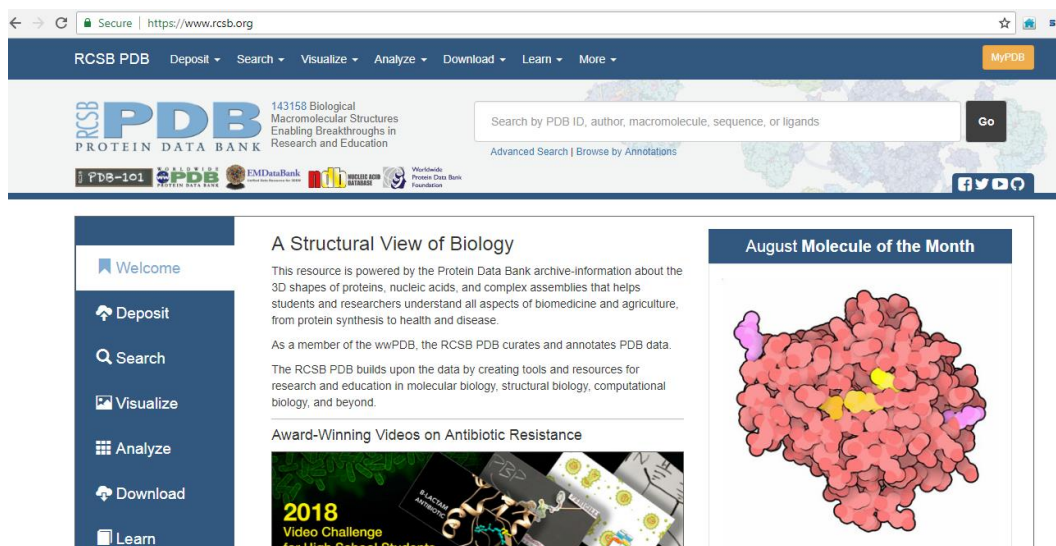


Trans-caryophyllene

Gambar V.3 Struktur 2D senyawa bunga kenanga

LAMPIRAN 4

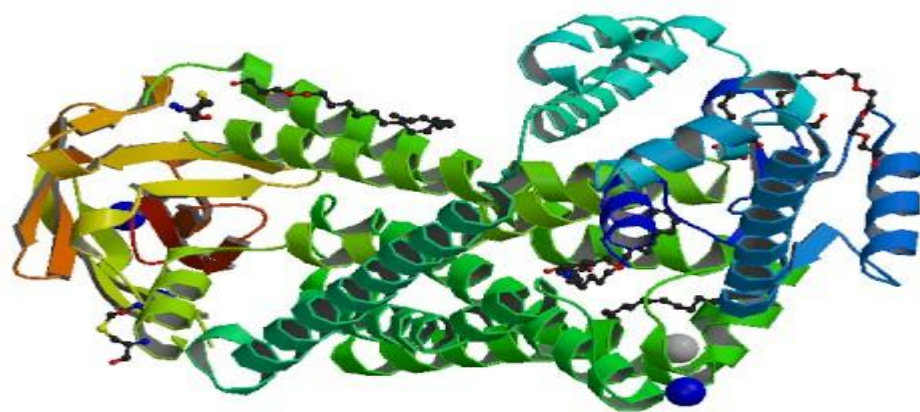
SITUS *PROTEIN DATA BANK*



The screenshot shows the homepage of the RCSB Protein Data Bank. At the top, there is a navigation bar with links for Deposit, Search, Visualize, Analyze, Download, Learn, and More. Below this is a search bar with the text "Search by PDB ID, author, macromolecule, sequence, or ligands" and a "Go" button. The main content area is divided into several sections: a "Welcome" sidebar, a "A Structural View of Biology" section with text about the resource's purpose and its role in the wwPDB, an "Award-Winning Videos on Antibiotic Resistance" section featuring a "2018 Video Challenge for High School Students" video thumbnail, and an "August Molecule of the Month" section displaying a 3D protein structure model.

Gambar V.4 Program situs *protein data bank*

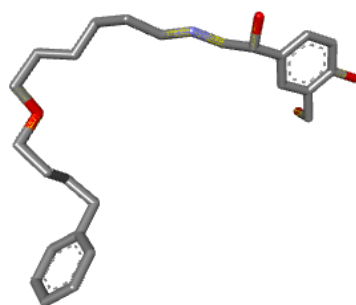
LAMPIRAN 5
STRUKTUR 3D RESEPTOR



Gambar V.5 Struktur 3D reseptor Salmeterol (6MXT)

UNIGA

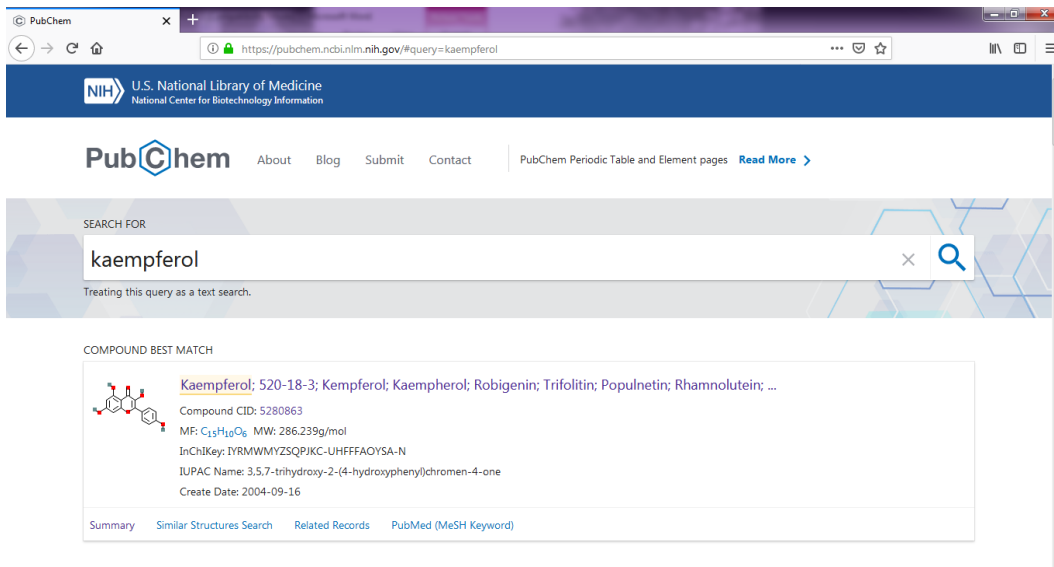
LAMPIRAN 6
LIGAN ALAMI 6MXT



Gambar V.6 Ligan alami dari reseptor 6MXT

LAMPIRAN 7

SITUS PUBCHEM



The screenshot displays the PubChem website interface. At the top, the NIH logo and "U.S. National Library of Medicine National Center for Biotechnology Information" are visible. The main navigation bar includes "PubChem", "About", "Blog", "Submit", "Contact", and "PubChem Periodic Table and Element pages Read More". A search bar is prominently featured with the text "SEARCH FOR" and "kaempferol" entered. Below the search bar, it states "Treating this query as a text search." The results section, titled "COMPOUND BEST MATCH", shows a chemical structure of kaempferol and the following information: "Kaempferol; 520-18-3; Kempferol; Kaempferol; Robigenin; Trifolitin; Populnetin; Rhamnolutein; ...", "Compound CID: 5280863", "MF: C₁₅H₁₀O₆ MW: 286.239g/mol", "InChIKey: IYRMWVYZSQJKC-UHFFFAOYSA-N", "IUPAC Name: 3,5,7-trihydroxy-2-(4-hydroxyphenyl)chromen-4-one", and "Create Date: 2004-09-16". At the bottom of the results box, there are links for "Summary", "Similar Structures Search", "Related Records", and "PubMed (MeSH Keyword)".

Gambar V.7 Situs pubchem

LAMPIRAN 8

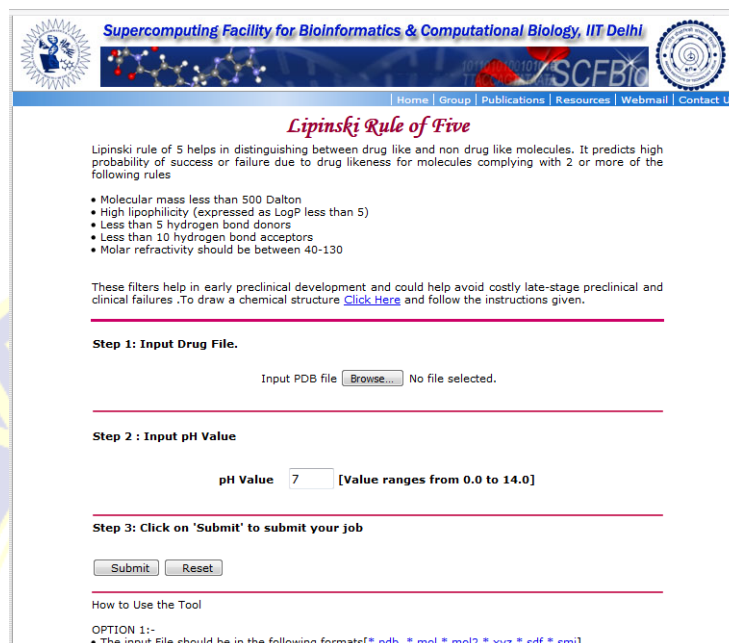
SITUS PRE-ADMET

The screenshot displays the PreADMET website. At the top, a blue navigation bar contains links for MDL, mol and sd file, Molecular descriptors, Druglikeness, ADME Prediction, Toxicity prediction, Log In, and Register. The PreADMET logo is on the left, and contact information (+82 2 393 9550-1, webmaster@bmdrc.kr) and the address (B138A, YONSEI ENGINEERING RESEARCH COMPLEX, YONSEI UNIVERSITY, SEOUL, REPUBLIC OF KOREA) are on the right. A secondary navigation bar includes Home, About, Druglikeness, ADME, Toxicity, Community, and Commercial. The main content area features a 'Welcome to the PreADMET' section with a brief description of the application. Below this are three service cards: 'Drug-Likeness Prediction' (Lipinski's rule, lead-like rule, Drug DB like rule), 'ADME Prediction' (caco-2, MDCK, BBB, HIA, plasma protein binding and skin permeability data), and 'Toxicity Prediction' (Ames test and rodent carcinogenicity assay). A 'Lastest News' section on the right lists updates such as 'G-SFED and Human Nephrotoxicity models will be added in Aug 2017' and 'PreADMET Ver 2.1 is coming soon in this month'.

Gambar V.8 Situs preADMET

LAMPIRAN 10

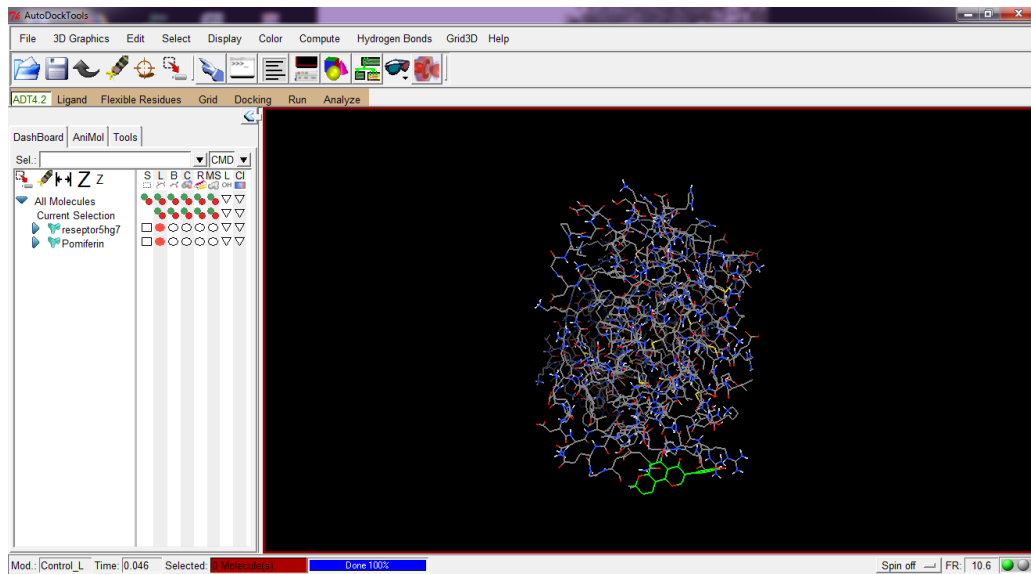
SITUS LIPINSKI'S RULE OF FIVE



The screenshot shows the web interface for the Lipinski Rule of Five tool. At the top, there is a header for the 'Supercomputing Facility for Bioinformatics & Computational Biology, IIT Delhi' with a navigation menu including 'Home', 'Group', 'Publications', 'Resources', 'Webmail', and 'Contact Us'. The main heading is 'Lipinski Rule of Five'. Below this, a paragraph explains the tool's purpose: 'Lipinski rule of 5 helps in distinguishing between drug like and non drug like molecules. It predicts high probability of success or failure due to drug likeness for molecules complying with 2 or more of the following rules'. A bulleted list of rules is provided: Molecular mass less than 500 Dalton, High lipophilicity (expressed as LogP less than 5), Less than 5 hydrogen bond donors, Less than 10 hydrogen bond acceptors, and Molar refractivity should be between 40-130. A note states: 'These filters help in early preclinical development and could help avoid costly late-stage preclinical and clinical failures. To draw a chemical structure [Click Here](#) and follow the instructions given.' The interface is divided into three steps: Step 1: 'Input Drug File.' with a text input field and a 'Browse...' button, showing 'No file selected.' Step 2: 'Input pH Value' with a text input field containing '7' and a label '[Value ranges from 0.0 to 14.0]'. Step 3: 'Click on 'Submit' to submit your job' with 'Submit' and 'Reset' buttons. At the bottom, there is a section 'How to Use the Tool' with 'OPTION 1:-' and a note: 'The input File should be in the following formats[*pdb, *mol, *mol2, *xyz, *sdf, *smi]'. The entire interface is overlaid on a large, semi-transparent watermark of the UNIGA logo.

Gambar V.10 Situs lipinski's rule of five

LAMPIRAN 11
PERANGKAT LUNAK AUTODOCK TOOLS



Gambar V.11 Tampilan program Autodock Tools

LAMPIRAN 12
VALIDASI METODE



Gambar V.12 Visualisasi tumpang tindih ligan alami 6MXT (biru) dengan ligan hasil *redocking* (kuning)

Tabel V.1

Grid Box, RMSD, Nilai Ikatan Energi, dan Validasi Metode Ligan Alami

Kode PDB	Grid Box	RMSD	Ikatan Energi Salbutamol (kkal/mol)	Ikatan Energi Ligan Alami (kkal/mol)
6MXT	X: -9,426 Y: -3,116 Z: 38,18	1,051 Å	-8,50	-10,33

LAMPIRAN 13
SIFAT FISIKOKIMIA 5 LIPINSKI

Tabel V.2

Sifat Fisikokimia Senyawa Bunga Kenanga Berdasarkan Aturan 5 Lipinski

No.	Senyawa	BM (g/mol)	Log P	Donor Hidrogen	AkseptorH idrogen	Refractory Molar	Ket
1	1-metoksi-4-metil benzene	122	2	0	1	40,73	Memenuhi
2	2,3-dimetoxytoluen	152	2,01	0	2	44,28	Memenuhi
3	Alpha Copaene	220	3,38	1	1	65,97	Memenuhi
4	Alpha Farnesene	204	5,2	0	0	70,99	Memenuhi
5	Alpha Pinene	136	2,99	0	0	43,75	Memenuhi
6	Benzil Benzoat	121	3,04	0	2	62	Memenuhi
7	Beta linalool	154	2,66	1	1	49,48	Memenuhi
8	Beta Mircen	136	3,47	0	0	48	Memenuhi
9	Beta Pinene	136	2,99	0	0	43,75	Memenuhi
10	Beta Silenene	204	4,72	0	0	66,74	Memenuhi
11	Metil Eugenol	194	1,64	0	3	52,98	Memenuhi
12	Trans Beta Ocimen	136	3,47	0	0	48	Memenuhi
13	Trans Cariopilene	204	4,72	0	0	66,74	Memenuhi

- Syarat :
1. BM <500 mg/mol
 2. Log P <5
 3. Donor Hidrogen <5
 4. Akseptor Hidrogen <10
 5. Molar Refractory antara 40-130

LAMPIRAN 14

HASIL PENAMBATAN MOLEKUL

Tabel V.3

Hasil Penambatan Molekuler Senyawa Bunga Kenanga (6MXT)

No.	Ligan	ΔG (kkal/mol)	Konstanta inhibisi (nM)
1	Ligan alami	-10,33	26,98
2	Salbutamol	-8,50	583,50
3	1-methoxy-4-methylbenzene	-4,76	322230
4	2,3-dimethoxytoluen	-4,68	370240
5	Alpha copaene	-7,72	2180
6	Alpha farnesene	-6,93	8370
7	Alpha pinene	-5,72	64430
8	Benzyl benzoate	-7,30	4460

**LAMPIRAN 14
(LANJUTAN)**

No.	Ligan	ΔG (kkal/mol)	Konstanta inhibisi (nM)
9	Beta linalool	-5,52	90660
10	Beta myrcene	-4,94	239170
11	Beta pinene	-5,68	68060
12	Beta silenene	-7,63	2540
13	Methyleugenol	-5,23	146990
14	Transbetaocimen	-5,17	162060
15	Trans-caryophyllene	-6,87	9250

LAMPIRAN 15

INTERAKSI IKATAN HIDROGEN DAN RESIDU ASAM AMINO

Tabel V.4

Hasil Analisis Ikatan Hidrogen dan Residu Asam Amino yang Terlibat (6MXT)

No.	Senyawa	Jumlah ikatan hidrogen	Residu asam amino
1	Ligan alami	6 (ASP1113, ASP1192, ASN1312, SER1207, SER1203, PHE1193)	VAL1117, VAL1114, TYR1306, ASP1192, PHE1290, HIS1206
2	Salbutamol	6 (ASP1113, ASN1312, ASN1293, SER1203, SER1207, TYR1316)	VAL1114, PHE1193, PHE1290
3	1-methoxy-4-methylbenzene	1 (SER1207)	VAL1117, VAL1114, ALA1200, SER1204, SER1203, THR1195, THR1118, TYR1199, PHE1193, PHE1290, ASN1293

(LANJUTAN)

No.	Senyawa	Jumlah ikatan hidrogen	Residu asam amino
4	2,3-dimethoxytoluen	0	VAL1117, VAL1114, ALA1200, SER1204, SER1203, THR1195
5	Alpha copaene	0	VAL1117, VAL1114, ALA1200, TYR119, TYR1308, PHE1193, PHE 1289, PHE 1290
6	Alpha farnesene	0	THR1110, TYR1308, VAL1114, HIS1093
7	Alpha pinene	0	SER1203, SER1204, SER1207, ASN1293, ALA1200, VAL1114
8	Benzyl benzoate	1 (ASN1312)	THR1110, THR1118, TRP1109, VAL1114, VAL1117
9	Beta linalool	2 (ASP1113, ASN1312)	SER1203, SER1204,

LAMPIRAN 15

(LANJUTAN)

No.	Senyawa	Jumlah ikatan hidrogen	Residu asam amino
10	Beta myrcene	0	SER1203, SER1204
11	Beta pinene	0	SER1203, SER1207
12	Beta silenene	0	SER1203, SER1204, SER1207, ASN1293
13	Methyleugenol	0	SER1203, ASN1312
14	Transbetaocimen	0	ASN1312, ASP1113
15	Trans-caryophyllene	0	ASP1113

LAMPIRAN 16

UJI PREADME

Tabel V.5

Uji PreADME (Absorpsi dan Distribusi) Senyawa Bunga Kenanga dan Obat Pemanding

No	Senyawa	Caco-2 (nm.sec ⁻¹)	HIA (%)	Protein Plasma Binding (%)
1	Salbutamol	19,30	75,95	13,36
2	1-methoxy-4-methylbenzene	29,44	96,47	100
3	2,3-dimethoxytoluen	57,55	100	100
4	Alpha copaene	23,01	100	100
5	Alpha farnesene	23,41	100	100
6	Alpha pinene	57,50	100	100
7	Benzyl benzoate	38,50	100	90,65
8	Beta linalool	29,35	100	100
9	Beta myrcene	23,63	100	100
10	Beta pinene	22,35	100	100

LAMPIRAN 16
(LANJUTAN)

No	Senyawa	Caco-2 (nm.sec ⁻¹)	HIA (%)	<i>Protein Plasma Binding (%)</i>
11	Beta silenene	23,50	100	100
12	Methyleugenol	58,09	100	100
13	Transbetaocimen	23,63	100	100
14	Trans-caryophyllene	23,53	100	100

Keterangan :

%HIA = 70-100% well absorbed, 20-70% moderately absorbed, 0-20% poorly absorbed.

In Vitro caco-2 cell permeability = > 70 higher permeability, 4-70 medium permeability, < 4 low permeability.

% PPB = 90% strongly bond, < 90% weakly bond.

LAMPIRAN 17**UJI TOKSISITAS****Tabel V.6**

Uji Toksisitas Senyawa Bunga Kenanga dan Obat Pembanding

No	Senyawa Ligan	Kroes TTC decision tree
1	Salbutamol	1
2	1-methoxy-4-methylbenzene	1
3	2,3-dimethoxytoluen	1
4	Alpha copaene	1
5	Alpha farnesene	1
6	Alpha pinene	1
7	Benzyl benzoate	1
8	Beta linalool	1
9	Beta myrcene	1
10	Beta pinene	1

LAMPIRAN 17
(LANJUTAN)

No	Senyawa Ligan	Kroes TTC decision tree
11	Beta silenene	1
12	Methyleugenol	1
13	Transbetaocimen	1
14	Trans-caryophyllene	1

Kroes TTC decision tree :

1 = Substance would not be expected to be a safety concern

2 = Negligible risk (low probability of a life-time cancer risk greater than in 10^6)

3 = Risk assesment requires compound-specific toxicity data