

Complete Oncological Phytochemical Compendium (Top 100)

Comprehensive Molecular Catalog, Direct Rankings, Mechanisms & Chronobiological Regimen

Introduction & Architectural Rationale

Plant-derived molecules exert multi-targeted effects in oncology, functioning as anti-proliferative, pro-apoptotic, anti-angiogenic, and immunomodulatory agents. Consolidating all 100 compounds into a single physical pill is chemically impossible due to mass limits, solubility clashes, and enzyme competition. This compendium lists all 100 compounds with mechanisms and maps them to a chronobiological 4-capsule compliance system.

Phase I: Phytocannabinoids (Cannabis sativa, 1–8)

1. Δ^9 -THC: Induces apoptosis via CB_1/CB_2 , halts cell cycle at G_0/G_1 , suppresses VEGF angiogenesis. **2. CBD:** Non-psychoactive ROS regulator, inhibits $NF-\kappa B$, blocks migration. **3. CBG:** Anti-proliferative epithelial cancer inhibitor. **4. CBN:** CB_2 microenvironmental immune modulator. **5. CBC:** Synergistic anti-tumor inflammation inhibitor. **6. THCV:** Receptor modulator altering metabolic tumor growth pathways. **7. CBDV:** TRP channel modulator suppressing hyper-proliferation. **8. CBE:** Regulatory survival checkpoint metabolite.

Phase II: Polyphenols & Flavonoids (9–50)

Regulate PI3K/AKT/mTOR, upregulate p53 and p21.

9. EGCG: Green tea MMP inhibitor, binds AKT1, downregulates EGFR. **10. Curcumin:** Suppresses $NF-\kappa B$, STAT3, COX-2, cyclin D1. **11. Resveratrol:** Activates AMPK, inhibits Wnt/ β -catenin. **12. Quercetin:** Inhibits PI3K/AKT, G_2/M arrest. **13. Genistein:** Blocks IGF-1R tyrosine kinase. **14. Kaempferol:** Downregulates Bcl-2, drives Bax. **15. Luteolin:** Suppresses VEGF angiogenesis and aromatase. **16. Apigenin:** Induces apoptosis, reduces $TNF-\alpha$ /IL-6. **17. Baicalein:** Activates caspase cascades. **18. Silymarin/Silibinin:** Stabilizes membranes, upregulates p53. **19. Naringenin:** Nrf2 antioxidant defense stimulation. **20. Hesperidin:** Blunts oxidative DNA damage. **21. Fisetin:** Senolytic mTOR inhibitor. **22. Myricetin:** Scavenges free radicals, blocks strand breaks. **23. Cyanidin:** Suppresses matrix-degrading enzymes. **24. Delphinidin:** Intracellular calcium mobilization apoptosis. **25. Pelargonidin:** Quenches ROS and proliferation rates. **26. Malvidin:** Selective colon/breast cancer cytotoxicity. **27. Peonidin:** Suppresses inflammatory tumor microenvironment cytokines. **28. Catechin:** Stabilizes AKT1 survival domains. **29. Epicatechin:** Binds ESR1 hormone-dependent pathways. **30. Procyanidins:** Reinforce genomic stability. **31. Theaflavin:** Downregulates oncogenic transcription factors. **32. Gallic Acid:** ROS-mediated malignant cell apoptosis. **33. Caffeic Acid:** Inhibits MMPs and motility. **34. Ferulic Acid:** Modulates phase II detoxification. **35. Chlorogenic Acid:** Suppresses the Warburg effect. **36. Rosmarinic Acid:** Suppresses COX-2 and iNOS. **37. Ellagic Acid:** Enhances DNA repair mechanisms. **38. Pterostilbene:** Methylated resveratrol analog. **39. Piceatannol:** FAK metastasis kinase inhibitor. **40. Daidzein:** Estrogen receptor modulator. **41. Formononetin:** Suppresses FGFR2–Akt signaling. **42. Glycitein:** Downregulates tumor markers. **43. Pratensein:** Modulates microenvironmental signaling. **44. Silidianin:** Milk thistle anti-mutagenic action. **45. Slicristin:** Scavenges lipid peroxides. **46. Naringin:** Inhibits CYP1A1 carcinogen activation. **47. Hesperetin:** Suppresses MMP-2 and MMP-9 invasion. **48. Eriodictyol:** Reduces surrounding oxidative stress. **49. Liquiritigenin:** Regulates estrogen receptor- α . **50. Isorhamnetin:** Intrinsic mitochondrial pathway apoptosis.

Phase III: Terpenoids & Triterpenoids (51–80)

Target structural proteins, nuclear transcription factors, and drive apoptosis.

51. Withaferin A: Inhibits proteasome, downregulates $\text{NF-}\kappa\text{B}$, paraptosis. **52. Betulinic Acid:** Mitochondrial outer membrane permeabilization in melanoma. **53. Ursolic Acid:** Inhibits STAT3 phosphorylation, cyclin D1. **54. Oleanolic Acid:** Protects normal cells from genotoxic stress. **55. Boswellic Acids (AKBA):** Inhibits 5-LOX, reduces peritumoral edema. **56. D-Limonene:** Phase II enzyme induction. **57. Paclitaxel:** Stabilizes microtubules, arrests mitosis. **58. Docetaxel:** High-affinity β -tubulin binder. **59. Ginsenoside Rg3:** Inhibits angiogenesis and MDR proteins. **60. Ginsenoside Rh2:** Suppresses metastatic cell adhesion. **61. Celastrol:** HSP90 and proteasome inhibitor. **62. Artemisinin:** Iron-dependent carbon radical generation. **63. Andrographolide:** Blocks $\text{NF-}\kappa\text{B}$ nuclear translocation. **64. Glycyrrhizin:** Hepatoprotective cytokine modulator. **65. Triptolide:** Inhibits RNA polymerase II transcription. **66. Oridonin:** ROS-mediated apoptotic induction. **67. Ginkgolide B:** Reduces micro-thrombi and metastasis. **68. Bilobalide:** Neuroprotective against chemotherapy. **69. Carnosic Acid:** Activates Nrf2/ARE antioxidant response. **70. Carnosol:** Inhibits prostate androgen receptors. **71. Thymol:** Membrane-disrupting cytotoxicity. **72. Carvacrol:** Intracellular calcium overload apoptosis. **73. Menthol:** Mucosal anti-inflammatory TRP modulator. **74. Camphor:** Antipruritic local anti-proliferative. **75. Beta-Sitosterol:** Sphingomyelinase apoptosis activation. **76. Campesterol:** Downregulates pro-inflammatory eicosanoids. **77. Stigmasterol:** Decreases malignant membrane integrity. **78. Lupeol:** Inhibits Ras-MAPK signaling. **79. Maslinic Acid:** Blocks serine/threonine protein phosphatases. **80. Erianthin:** Disrupts tubulin assembly.

Phase IV: Organosulfur Compounds, Alkaloids & Glycosides (81–100)

Control carcinogen metabolism, block replication, and alter epigenetic modifications.

81. Sulforaphane: Activates Nrf2, inhibits HDACs. **82. Allicin:** Modulates enzyme thiol groups. **83. Indole-3-Carbinol (I3C):** Protective C-2 estrogen hydroxylation. **84. DIM:** Regulates cell cycle and matrix invasion. **85. DADS:** Inhibits histone deacetylases. **86. DATS:** Reactive sulfur intrinsic apoptosis. **87. Camptothecin:** DNA topoisomerase I inhibitor. **88. Vinblastine:** Prevents microtubule formation. **89. Vincristine:** Metaphase spindle arrest in leukemias. **90. Berberine:** Inhibits mitochondrial complex I, activates AMPK. **91. Piperine:** Inhibits glucuronidation, boosts bioavailability. **92. Sanguinarine:** DNA cleavage apoptosis. **93. Chelidone:** p53-independent G2/M arrest. **94. Tomatine:** Sterol membrane disruption. **95. Solanine:** Inhibits acetylcholinesterase and viability. **96. Sinigrin:** Bioactive isothiocyanate precursor. **97. Glucoraphanin:** Stable sulforaphane precursor. **98. Ajoene:** Inhibits protein prenylation. **99. Capsaicin:** TRPV1 calcium-mediated apoptosis. **100. Lycopene:** Quenches singlet oxygen, gap-junction communication.

Comparative Mechanism Summary Matrix

Phytochemical Class	Key Primary Molecular Targets	Functional Outcome for Patients
Phytocannabinoids	\$CB_1\$, \$CB_2\$, TRPV1, PPARs	Apoptosis induction, \$VEGF\$ suppression, pain/nausea palliation.
Polyphenols & Flavonoids	PI3K/AKT, mTOR, \$NF-\kappa\$B\$, MMPs	Anti-metastatic, cell cycle arrest (\$G_2/M\$), chemo-sensitization.
Terpenoids & Triterpenoids	Tubulin, STAT3, Proteasome, HSP90	Mitotic arrest, intrinsic apoptosis, anti-inflammatory protection.
Organosulfurs & Alkaloids	Topoisomerases, HDACs, Nrf2, DNA	DNA replication blockage, Phase II detoxification induction.

Chronobiological Multi-Dose Compliance Pack Architecture

To safely administer all 100 molecules without chemical conflict, the protocol utilizes a **4-Capsule Daily Matrix** distributed across a 7-day weekly blister pack system:

Capsule A: Morning Lipophilic Matrix (Breakfast)
Contents: Cannabinoids (1–8), Terpenes (51–80), Piperine (#91).
Delivery: MCT-oil softgel for lymphatic uptake and enhanced absorption.

Capsule B: Mid-Day Aqueous Polyphenols (Lunch)
Contents: Polyphenols & Flavonoids (9–50).
Delivery: Enteric-coated HPMC capsule protecting acid-sensitive catechins.

Capsule C: Evening Organosulfur Block (Dinner)
Contents: Organosulfurs, Alkaloids, Glycosides (81–100).
Delivery: Vegetable cellulose buffered with ginger root powder.

Capsule D: Pre-Sleep Neuro-Regulatory (Bed)
Contents: Minor cannabinoids (CBN, CBDV, CBG) & monoterpenes.
Delivery: Sublingual lipid micro-capsule for nocturnal recovery.

Operational Delivery: Compounding pharmacies package this protocol into hermetically sealed 7-Day Aluminum-Aluminum Blister Packs to protect moisture-sensitive components (EGCG, Sulforaphane) and prevent enzymatic competition.