HERBICIDE RESISTANCE ACTION COMMITTEE 除草剂 抗性行动 委员会

HRAC Mode of Action Classification HRAC除草剂作用机理分类2024

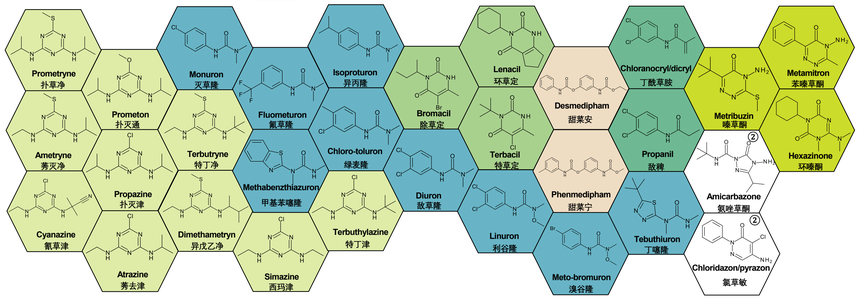
GO ON OUR WEBSITE

Light Activation of ROS[a] 活性氧光活化

5 Inhibition of Photosynthesis at PS II: 光合作用光系统II（PS II)抑制剂

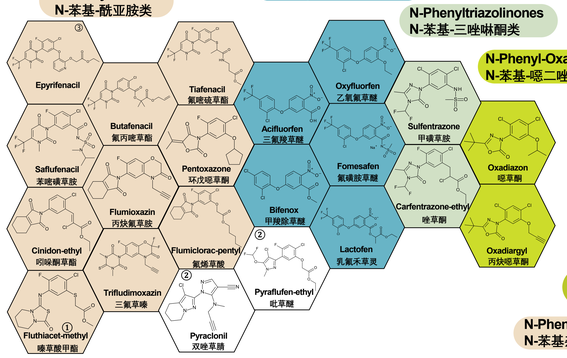
D1 Serine 264 binders (and other non-histidine 215 binders)
D1丝氨酸264结合剂（及其它非组氨酸215结合剂）

Triazines 三嗪类 · Ureas 脲类 · Uracils 脲嘧啶类 · Phenylcarbamates 苯基氨基甲酸酯类 · Amides 酰胺类 · Triazinones 三嗪酮类



14 Inhibition of Protoporphyrinogen Oxidase (PPO) 原卟啉原氧化酶（PPO）抑制剂

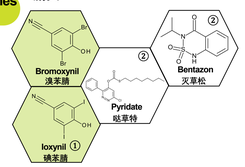
N-Phenylimides N-苯基-酰亚胺类 · Diphenyl ethers 二苯醚类 · N-Phenyltriazolinones N-苯基-三唑啉酮类 · N-Phenyl-Oxadiazolones N-苯基-噁二唑酮类



6 Inhibition of Photosynthesis at PS II 光合作用光系统 II （PS Ⅱ)抑制剂

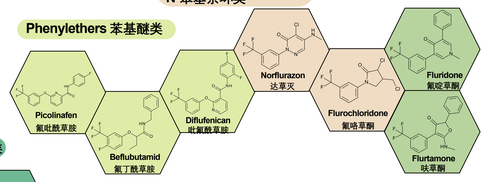
D1 Histidine 215 binders
D1 组氨酸215结合剂

Nitriles 腈类 also uncouplers 也是解偶联剂



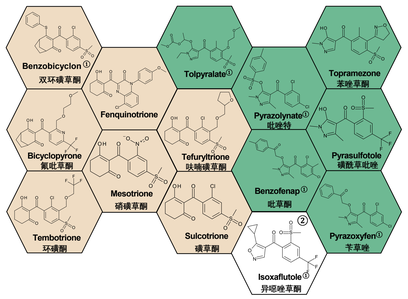
12 Inhibition of Phytoene Desaturase (PDS) 八氢番茄红素脱氢酶(PDS)抑制剂

N-Phenyl heterocycles N-苯基杂环类 · Diphenyl heterocycles 二苯基杂环类



27 Inhibition of Hydroxyphenyl Pyruvate Dioxygenase (HPPD) 对羟苯基丙酮酸双氧化酶（HPPD）抑制剂

Triketones 三酮类 · Pyrazoles 吡唑类

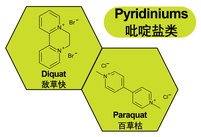


32 Inhibition of Solanesyl Diphosphate Synthase (SDPS) 茄尼酯二磷酸合成酶（SDPS）抑制剂

33 Inhibition of Homogentisate Solanesyltransferase (HST) 尿黑酸茄尼酯转移酶（HST）抑制剂

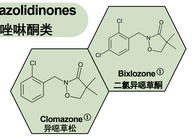
22 PS I Electron Diversion 影响光合系统I电子传递

Pyridiniums 吡啶盐类



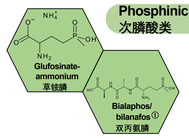
13 Inhibition of Deoxy-D-Xylulose Phosphate Synthase (DXPS) 脱氧-D-木酮糖磷酸合成酶（DXPS)抑制剂

Isoxazolidinones 异噁唑啉酮类



10 Inhibition of Glutamine Synthetase (GS) 谷氨酰胺合成酶(GS)抑制剂

Phosphinic acids 次膦酸类



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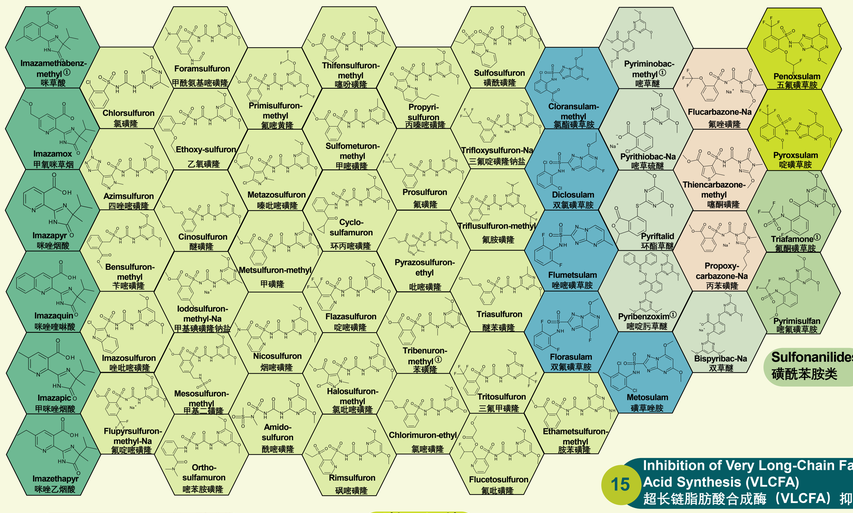
Cellular Metabolism 细胞代谢

2 Inhibition of Acetolactate Synthase (ALS) 乙酰乳酸合成酶（ALS）抑制剂

Imidazolinones 咪唑啉酮类 · Sulfonylureas 磺酰脲类 · Pyrimidinylbenzoates嘧啶苯甲酸类 · Triazolopyrimidines – type 1 三唑并嘧啶1类 · Triazolopyrimidine – type 2 三唑并嘧啶2类 · Triazolinones三唑啉酮类

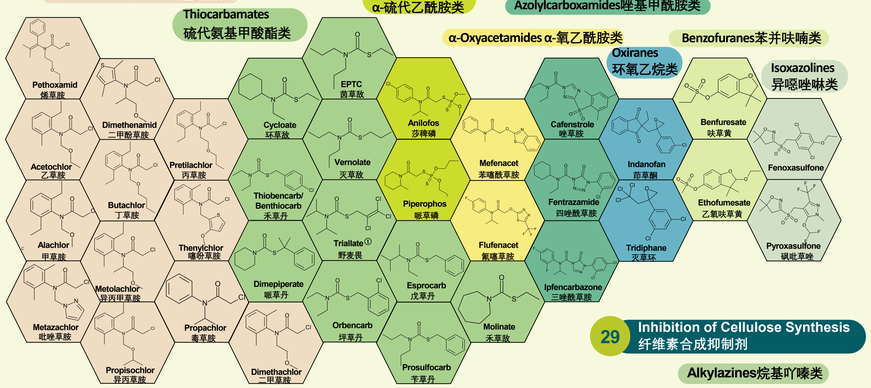


15 Inhibition of Very Long-Chain Fatty Acid Synthesis (VLCFA) 超长链脂肪酸合成酶（VLCFA）抑制剂

Sulfonanilides 磺酰苯胺类

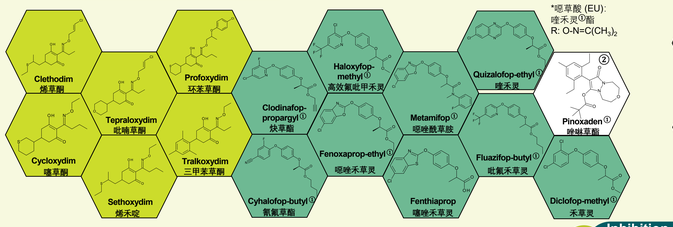
α-Chloroacetamidesα-氯乙酰胺类 · α-Thioacetamides α-硫代乙酰胺类 · Azolylcarboxamides唑基甲酰胺类 · α-Oxyacetamides α-氧乙酰胺类 · Benzofuranes苯并呋喃类 · Oxiranes 环氧乙烷类 · Isoxazolines 异噁唑啉类

Thiocarbamates 硫代氨基甲酸酯类



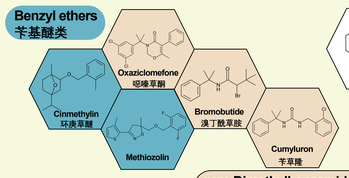
1 Inhibition of Acetyl CoA Carboxylase (ACCase) 乙酰辅酶 A 羧化酶（ACCase）抑制剂

Cyclohexanediones环己烯酮类(DIMs) · Aryloxphenoxypropionates芳氧苯氧丙酸酯类（FOPs）

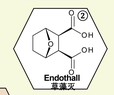


30 Inhibition of Fatty Acid Thioesterase (FAT) 脂肪酸硫酯酶（FAT）抑制剂

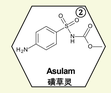
Benzyl ethers 苄基醚类



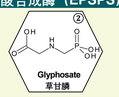
31 Inhibition of Serine Threonine Protein Phosphatase (STPP) 丝氨酸苏氨酸蛋白磷酸酶（STPP）抑制剂



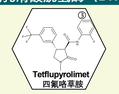
18 Inhibition of Dihydropteroate Synthase (DHPS) 二氢蝶酸合成酶（DHPS）合成酶



9 Inhibition of Enolpyruvyl Shikimate Phosphate Synthase (EPSPS) 烯醇丙酮酰莽草酸磷酸合成酶（EPSPS）抑制剂

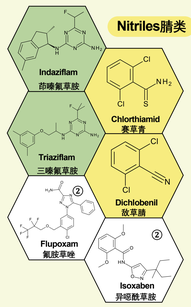


28 Inhibition of Dihydroorotate Dehydrogenase (DHODH) 二氢乳清酸脱氢酶（DHODH）抑制剂



29 Inhibition of Cellulose Synthesis 纤维素合成抑制剂

Alkylazines烷基吖嗪类 · Nitriles腈类

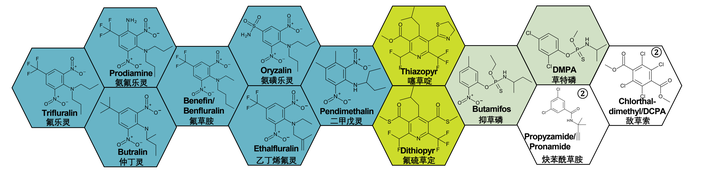


1 Inhibition of Acetyl CoA Carboxylase (ACCase) 乙酰辅酶 A 羧化酶（ACCase）抑制剂

Cell Division and Growth 细胞分裂与生长

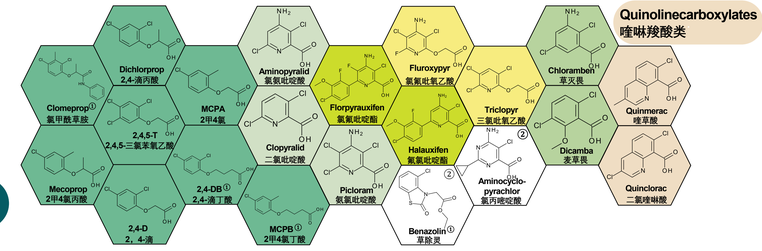
3 Inhibition of Microtubule Assembly 微管组装抑制剂

Dinitroanilines 二硝基苯胺类 · Pyridines 吡啶类 · Phosphoroamidates 氨基磷酸盐类



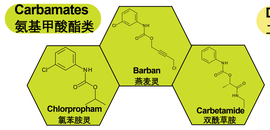
4 Auxin Mimics 生长素模拟物

6-Chloropicolinates 6-氯吡啶甲酸类 · Pyridyloxycarboxylates 吡啶氧羧酸类 · Phenoxycarboxylates 苯氧羧酸类 · 6-Arylpicolinates6-芳基吡啶甲酸类 · Benzoates 苯甲酸类 · Quinolinecarboxylates 喹啉羧酸类



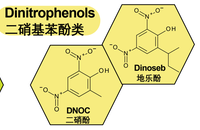
23 Inhibition of Microtubule Organization微管组织抑制剂

Carbamates 氨基甲酸酯类



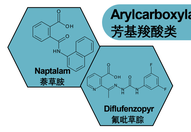
24 Uncouplers 解偶联剂

Dinitrophenols 二硝基苯酚类



19 Auxin Transport Inhibitors 生长素运输抑制剂

Arylcarboxylates 芳基羧酸类

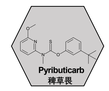


HRAC 分类	原HRAC 分类	作用机理
1	A	乙酰辅酶 A 羧化酶（ACCase）抑制剂
2	B	乙酰乳酸合成酶（ALS）抑制剂
3	K1	微管组装抑制剂
4	O	生长素模拟物
5	C1,2	光合作用光系统II（PSII)-D1丝氨酸264结合剂
6	C3	光合作用光系统II（PSII)-D1组氨酸215结合剂
9	G	烯醇丙酮酰莽草酸磷酸合成酶（EPSPS）抑制剂
10	H	谷氨酰胺合成酶(GS)抑制剂
12	F1	八氢番茄红素脱氢酶(PDS)抑制剂
13	F4	脱氧-D-木酮糖磷酸合成酶（DXPS)抑制剂
14	E	原卟啉原氧化酶（PPO）抑制剂
15	K3	超长链脂肪酸合成酶（VLCFA）抑制剂

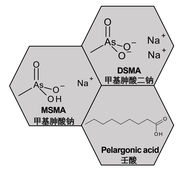
HRAC 分类	原HRAC 分类	作用机理
18	I	二氢蝶酸合成酶（DHPS）抑制剂
19	P	生长素运输抑制剂
22	D	影响光合系统I电子传递
23	K2	微管组织抑制剂
24	M	解偶联剂
27	F2	对羟苯基丙酮酸双氧化酶（HPPD）抑制剂
28	无	二氢乳清酸脱氢酶（DHODH）抑制剂
29	L	纤维素合成抑制剂
30	Q	脂肪酸硫酯酶（FAT）抑制剂
31	R	丝氨酸苏氨酸蛋白磷酸酶（STPP）抑制剂
32	S	茄尼酯二磷酸合成酶（SDPS）抑制剂
33	T	尿黑酸茄尼酯转移酶（HST）抑制剂
Ø	Z	未知作用机理

Ø Unknown Mode of Action 未知作用机理

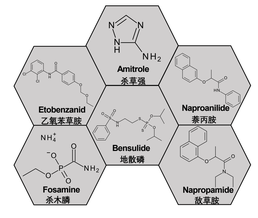
tentative target (FRAC) squalene epoxidase 暂定靶标鲨烯环氧酶



Multisite herbicides 多作用位点除草剂



herbicides with inconclusive MoA data 无明确作用机理除草剂



[a] Reactive oxygen species 活性氧

① Indicates pro-herbicide 表示"前体除草剂"

② HRAC's recommendation is not to include a chemical family name when there is one active in the family.
Actives without chemical family names are indicated with a white background. HRAC建议，如果某种化学结构分类中，只有一个活性成分，则该成分背景为白色，并且不显示分类名称。

③ New actives which are still in the process of registration at the time of release of the current poster version. 本版本发布时正在登记的活性成分

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