動植物研究前沿分析 –2012Q2

本計畫將利用 Thomson Reuters 出版 ESI 資料庫所提供之「研究前沿」(Research Front)功能，定期提供動植物領域前十名之熱門研究前沿主題。主要期望科研人員能了解各研究前沿之核心文獻，有助於獲知目前全球動植物領域的研究成果有哪些重要發現，更能反映出當前科學家重點關注的方向。另外也會透過資訊加值分析，提供各前沿主題之研發跨領域分布，以作為科研人員進行研發策略規劃之團隊組成之參考。

TOP10 動植物領域研究前沿

前沿排名	前沿	摘要說明
前沿 1	SWINE-ORIGIN 2009 A(H1N1) INFLUENZA VIRUSES CIRCULATING; 2009 SWINE-ORIGIN H1N1 INFLUENZA; 2009 INFLUENZA A(H1N1) ACUTE RESPIRATORY DISTRESS SYNDROME; PANDEMIC 2009 INFLUENZA A(H1N1) INFECTION; NEW SWINE-ORIGIN H1N1 INFLUENZA VIRUSES IN PLANT & ANIMAL SCIENCE	人畜共通的傳染病，如禽流感及豬流感的引進可能會在人口密集處廣為流行，這種人畜共通的疾病傳播能力通常被認為與病毒的遺傳物質突變有關。評估豬流感及禽流感對人類的跨物種轉移潛在能力便成為科學家研究重點之一。
前沿 2	PSEUDOMONAS SYRINGAE EFFECTOR AVRPTO; INNATE IMMUNITY; PLANT PATTERN-RECOGNITION RECEPTOR CONFERS BROAD-SPECTRUM BACTERIAL RESISTANCE; PLANT INNATE IMMUNE RECEPTOR; BACTERIAL VIRULENCE PROTEIN SUPPRESSES HOST INNATE IMMUNITY IN PLANT & ANIMAL SCIENCE	植物透過模式辨識受體(Pattern-Recognition Receptor，PRR)來辨認與病原體有關的分子模式(pathogen-associated molecular patterns，PAMPs)，藉此感知微生物的入侵。這些受體通常位於細胞表面。病原體成功入侵植物體的關鍵在於降低PAMPs 的感知能力及阻斷訊號分子的傳遞路徑。這些可干擾 PRR 路徑的分子便成為科學家們熱門的研究課題。
前沿 3	ASYMMETRIC COEVOLUTIONARY NETWORKS; BIODIVERSITY MAINTENANCE; GRASSLAND COMMUNITIES REQUIRES HIGHER BIODIVERSITY; FUNCTIONAL BIODIVERSITY RESEARCH; BIODIVERSITY EFFECTS; BIODIVERSITY IMPROVES WATER QUALITY IN PLANT & ANIMAL SCIENCE	在過去十幾年中，生物多樣性及生態系統功能相關研究層出不窮。在這部分的研究包括(1)全球環境劇變所導致的生物多樣性喪失(2)生物多樣性減少導致物種的組成改變，這些改變可能會對與人類活動息息相關之重要生態系統造成衝擊；如食物生產、病蟲害防治等。因此，如何取得農業生產及維護生態之間的平衡仍是全球急需解決的問題。
前沿 4	ZINC-FINGER NUCLEASES; ENGINEERED	鋅指核酸酶是一類通過基因工程改造的

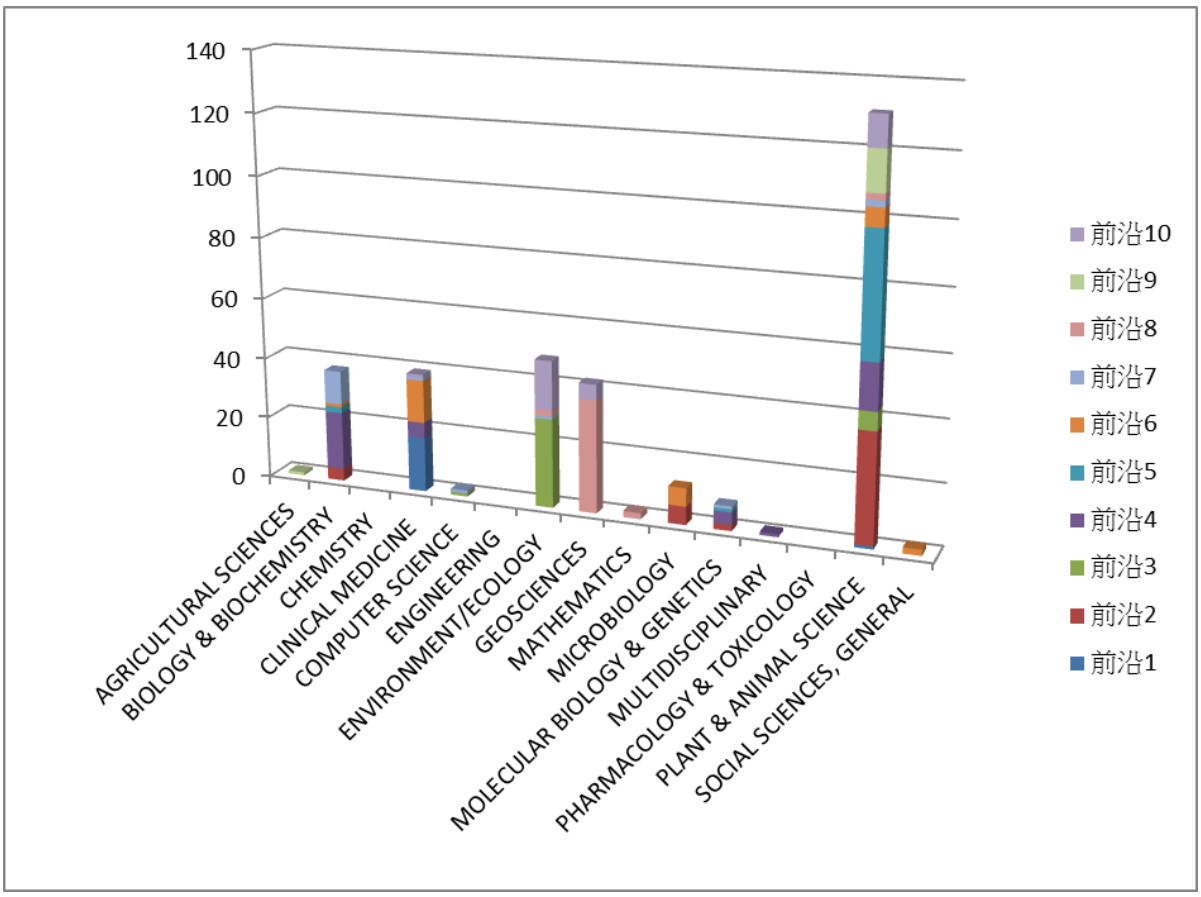
	ZINC-FINGER NUCLEASES; ENGINEERED ZINC FINGER NUCLEASES; DESIGNED ZINC-FINGER NUCLEASES; CUSTOM-DESIGNED ZINC FINGER NUCLEASES IN PLANT & ANIMAL SCIENCE	基因組編輯核酸酶，它們能夠識別並結合指定的位點，高效且精確地切斷靶 DNA。並利用細胞自然的 DNA 修復過程來修復靶基因的斷裂，進行基因組編輯；包括基因修復、基因刪除等工作，並定位和準確改變生物基因組。此項研究為植物基因體功能研究及植物病害等方面創造了新的可能性。
前沿 **5**	TYPE 2C PROTEIN PHOSPHATASES; ABSCISIC ACID-ACTIVATED PROTEIN KINASES; ABSCISIC ACID INHIBITS TYPE 2C PROTEIN PHOSPHATASES; ABSCISIC ACID SIGNALING IN-VIVO; ABSCISIC ACID RECEPTOR PYR1; ABSCISIC ACID RECEPTOR PYL5 IN PLANT & ANIMAL SCIENCE	2C 型蛋白質水解磷酸酶（Type 2C protein phosphatases，PP2Cs)是參與離層酸(ABA)訊號傳遞的重要分子，離層酸為植物在對抗乾旱逆境時重要的賀爾蒙，因此研究 PP2C 與離層酸訊號傳遞路徑之間的關係，將有助於提升作物之抗旱性。
前沿 **6**	GREAT NEGLECTED TROPICAL DISEASES; SOIL-TRANSMITTED HELMINTH INFECTIONS; HUMAN HELMINTH INFECTIONS; COPROANTIGEN REDUCTION TEST (CRT) PROTOCOL; NATIONWIDE SCHOOL-BASED HELMINTH CONTROL IN PLANT & ANIMAL SCIENCE	一些人畜共通的寄生蟲疾病，如蠕蟲、肝片吸血蟲等。人類常因生吃水生植物如西洋菜，或因喝了未煮沸的含囊狀幼蟲的水而感染。三氯苯達唑（TCBZ）因耐受性好且治療期間短，便成為治療此類疾病的新興藥物。TCBZ 的使用研究可為此類疾病提供一個有效的治療及控制方法。
前沿 **7**	ARTHROPOD PHYLOGENY; SEA ANEMONE GENOME REVEALS ANCESTRAL EUMETAZOAN GENE REPERTOIRE; ARTHROPOD PHYLOGENY REVISITED; ARTHROPOD RELATIONSHIPS REVEALED; PROTEIN-CODING NUCLEAR GENE SEQUENCE IN PLANT & ANIMAL SCIENCE	自從生物學問世以來，人類一直致力於了解節肢動物各主要綱之間的關係。節肢動物的演化對研究甲殼類動物物種之間的關係有極大的助益，透過形態學的觀點；如化石及分子生物學相關數據來進行此方面的研究，可使人類了解自然和地球生物多樣性起源。
前沿 **8**	ARCTIC OCEAN SEA ICE COVER; 2007 ARCTIC SEA ICE EXTENT MINIMUM; ARCTIC SEA ICE COVER; EXTREME ARCTIC SEA ICE MELT; SEA ICE FREE SUMMER ARCTIC IN PLANT & ANIMAL SCIENCE	北冰洋（Arctic Ocean）位於北半球座落於北極圈以內的海洋，是世界五大洋最小、最淺的海洋。近年來，科學家致力於研究全球暖化對北冰洋氣候和環境的影響，主要的目的是透過對北冰洋洋流、含鹽度和溫度等數據的搜整和分析，建立一個能夠準確預測北冰洋氣候和環境變化的模型。
前沿 **9**	MODEL GRASS BRACHYPODIUM DISTACHYON; GRASS GENOME EVOLUTION; BARLEY GENOME;	二穗短柄草（Brachypodium distachyon）原生於地中海和中東，是一種當地野生

	GENOME SEQUENCING; GRAPEVINE GENOME SEQUENCE SUGGESTS ANCESTRAL HEXAPLOIDIZATION IN PLANT & ANIMAL SCIENCE	草本植物，其基因組已完成定序。使用短柄草、水稻和高粱基因組進行的比較基因組研究，不僅為草本植物之基因組演化提供了線索，且有助於新能源作物和糧食作物模型的建立。
前沿 **10**	CO2-DRIVEN OCEAN ACIDIFICATION; LARVAL SURVIVAL; NEAR-FUTURE OCEAN ACIDIFICATION; OCEAN ACIDIFICATION CAUSES BLEACHING; OCEAN ACIDIFICATION ALTERS SKELETOGENESIS; IMMINENT OCEAN ACIDIFICATION IN PLANT & ANIMAL SCIENCE	海洋酸化是由於燃燒化石燃料，排放大量的二氧化碳到大氣中，這些二氧化碳又被海洋吸收所致。海洋酸化使海水化學性質改變，並對海洋生態系造成了極大的威脅，如熱帶珊瑚失去造礁能力等。因此，藉由觀察多種環境因子及大氣組成改變，推估對環境所造成的非預期影響是很重要的。

Top10 研究前沿的核心文獻各領域的統計(數量)

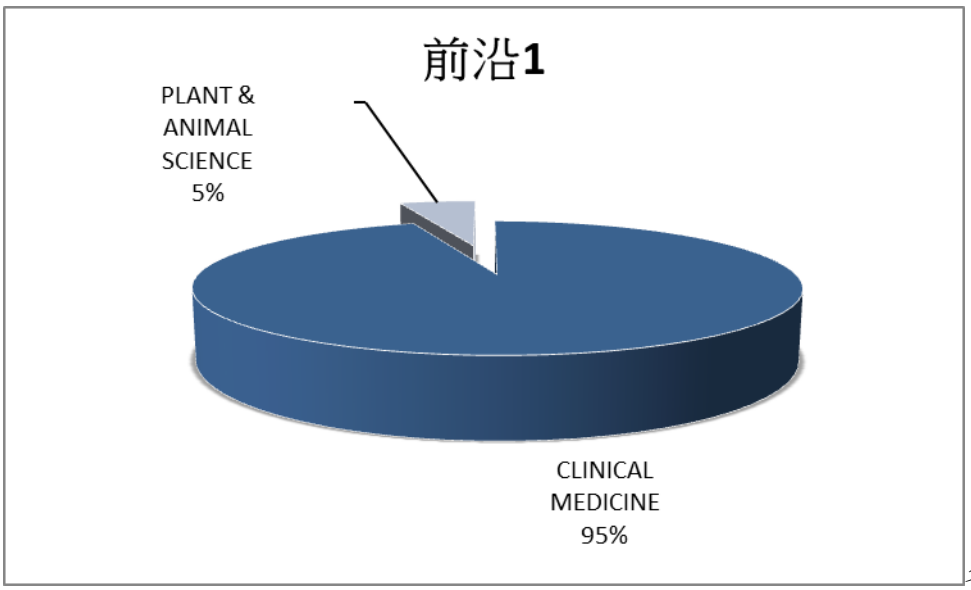
	AGRICULTURAL SCIENCES	BIOLOGY & BIOCHEMISTRY	CHEMISTRY	CLINICAL MEDICINE	COMPUTER SCIENCE	ENGINEERING	ENVIRONMENT/ECOLOGY	GEOSCIENCES	MATHEMATICS	MICROBIOLOGY	MOLECULAR BIOLOGY & GENETICS	MULTIDISCIPLINARY	PHARMACOLOGY & TOXICOLOGY	PLANT & ANIMAL SCIENCE	SOCIAL SCIENCES, GENERAL
前沿 **1**				18										1	
前沿 **2**		4								6	2			36	
前沿 **3**					1		29							6	
前沿 **4**		19		5							4	1		15	
前沿 **5**		2									1			40	
前沿 **6**		1		14						6				6	2
前沿 **7**		11		1	1		1				1			2	
前沿 **8**							2	37	2					2	
前沿 **9**	1													13	
前沿 **10**				1			16	5						10	

Top10 研究前沿的核心文獻各領域的統計分佈圖(數量)



動植物前沿一

SWINE-ORIGIN 2009 A(H1N1) INFLUENZA VIRUSES CIRCULATING; 2009 SWINE-ORIGIN H1N1 INFLUENZA; 2009 INFLUENZA A(H1N1) ACUTE RESPIRATORY DISTRESS SYNDROME; PANDEMIC 2009 INFLUENZA A(H1N1) INFECTION; NEW SWINE-ORIGIN H1N1 INFLUENZA VIRUSES IN PLANT & ANIMAL SCIENCE



各分類領域比例圖

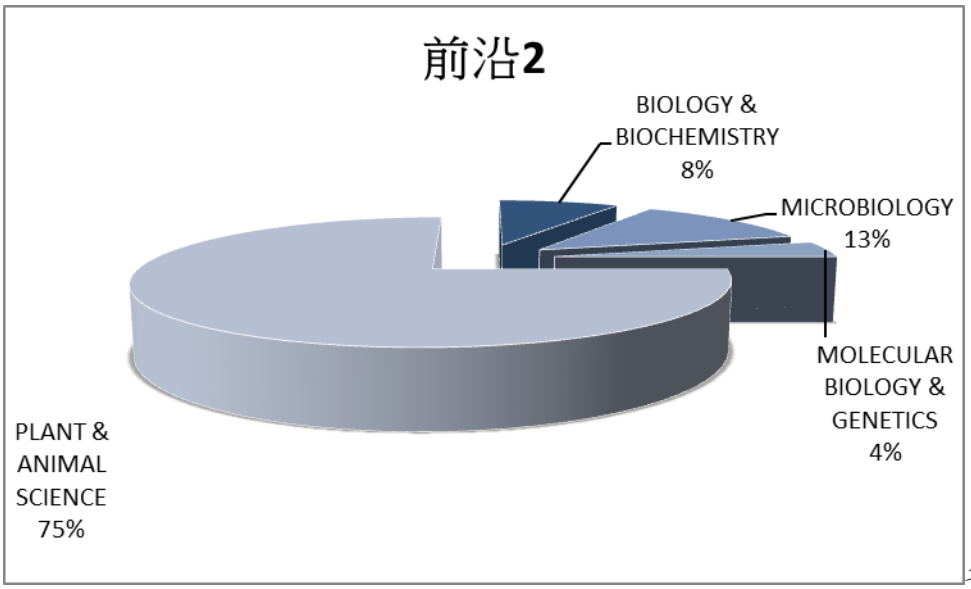
核心文獻清單

核心文獻標題	Citation	分類領域
EMERGENCE OF A NOVEL SWINE-ORIGIN INFLUENZA A (H1N1) VIRUS IN HUMANS NOVEL SWINE-ORIGIN INFLUENZA A (H1N1) VIRUS INVESTIGATION TEAM	1047	CLINICAL MEDICINE
ANTIGENIC AND GENETIC CHARACTERISTICS OF SWINE-ORIGIN 2009 A(H1N1) INFLUENZA VIRUSES CIRCULATING IN HUMANS	615	CLINICAL MEDICINE
HOSPITALIZED PATIENTS WITH 2009 H1N1 INFLUENZA IN THE UNITED STATES, APRIL-JUNE 2009.	540	CLINICAL MEDICINE
PNEUMONIA AND RESPIRATORY FAILURE FROM SWINE-ORIGIN INFLUENZA A (H1N1) IN MEXICO	484	CLINICAL MEDICINE
ORIGINS AND EVOLUTIONARY GENOMICS OF THE 2009 SWINE-ORIGIN H1N1 INFLUENZA A EPIDEMIC	409	CLINICAL MEDICINE
CRITICALLY ILL PATIENTS WITH 2009 INFLUENZA A(H1N1) INFECTION IN CANADA	399	CLINICAL MEDICINE
IN VITRO AND IN VIVO CHARACTERIZATION OF NEW SWINE-ORIGIN H1N1 INFLUENZA VIRUSES	336	CLINICAL MEDICINE
CRITICAL CARE SERVICES AND 2009 H1N1 INFLUENZA IN AUSTRALIA AND NEW ZEALAND.	333	CLINICAL MEDICINE
FACTORS ASSOCIATED WITH DEATH OR HOSPITALIZATION DUE TO PANDEMIC 2009 INFLUENZA A(H1N1) INFECTION IN CALIFORNIA	295	CLINICAL MEDICINE

CRITICALLY ILL PATIENTS WITH 2009 INFLUENZA A(H1N1) IN MEXICO	286	CLINICAL MEDICINE
SEVERE RESPIRATORY DISEASE CONCURRENT WITH THE CIRCULATION OF H1N1 INFLUENZA	246	CLINICAL MEDICINE
EXTRACORPOREAL MEMBRANE OXYGENATION FOR 2009 INFLUENZA A(H1N1) ACUTE RESPIRATORY DISTRESS SYNDROME	231	CLINICAL MEDICINE
TRANSMISSION AND PATHOGENESIS OF SWINE-ORIGIN 2009 A(H1N1) INFLUENZA VIRUSES IN FERRETS AND MICE	224	CLINICAL MEDICINE
TRIPLE-REASSORTANT SWINE INFLUENZA A (H1) IN HUMANS IN THE UNITED STATES, 2005-2009	218	CLINICAL MEDICINE
PATHOGENESIS AND TRANSMISSION OF SWINE-ORIGIN 2009 A(H1N1) INFLUENZA VIRUS IN FERRETS	205	CLINICAL MEDICINE
EFFICACY AND ECONOMIC ASSESSMENT OF CONVENTIONAL VENTILATORY SUPPORT VERSUS EXTRACORPOREAL MEMBRANE OXYGENATION FOR SEVERE ADULT RESPIRATORY FAILURE (CESAR): A MULTICENTRE RANDOMISED CONTROLLED TRIAL	185	CLINICAL MEDICINE
INTENSIVE CARE ADULT PATIENTS WITH SEVERE RESPIRATORY FAILURE CAUSED BY INFLUENZA A (H1N1)V IN SPAIN	164	CLINICAL MEDICINE
CASES OF SWINE INFLUENZA IN HUMANS: A REVIEW OF THE LITERATURE	137	CLINICAL MEDICINE
AVIAN AND SWINE INFLUENZA VIRUSES: OUR CURRENT UNDERSTANDING OF THE ZOONOTIC RISK	71	PLANT & ANIMAL SCIENCE

動植物前沿二

PSEUDOMONAS SYRINGAE EFFECTOR AVRPTO; INNATE IMMUNITY; PLANT PATTERN-RECOGNITION RECEPTOR CONFERS BROAD-SPECTRUM BACTERIAL RESISTANCE; PLANT INNATE IMMUNE RECEPTOR; BACTERIAL VIRULENCE PROTEIN SUPPRESSES HOST INNATE IMMUNITY IN PLANT & ANIMAL SCIENCE



各分類領域比例圖

核心文獻清單

核心文獻標題	Citation	分類領域
HOST-MICROBE INTERACTIONS: SHAPING THE EVOLUTION OF THE PLANT IMMUNE RESPONSE	604	MOLECULAR BIOLOGY & GENETICS
PERCEPTION OF THE BACTERIAL PAMP EF-TU BY THE RECEPTOR EFR RESTRICTS AGROBACTERIUM-MEDIATED TRANSFORMATION	297	MOLECULAR BIOLOGY & GENETICS
A FLAGELLIN-INDUCED COMPLEX OF THE RECEPTOR FLS2 AND BAK1 INITIATES PLANT DEFENCE	240	PLANT & ANIMAL SCIENCE
DIRECT PROTEIN INTERACTION UNDERLIES GENE-FOR-GENE SPECIFICITY AND COEVOLUTION OF THE FLAX RESISTANCE GENES AND FLAX RUST AVIRULENCE GENES	206	PLANT & ANIMAL SCIENCE
A RENAISSANCE OF ELICITORS: PERCEPTION OF MICROBE-ASSOCIATED MOLECULAR PATTERNS AND DANGER SIGNALS BY PATTERN-RECOGNITION RECEPTORS	188	PLANT & ANIMAL SCIENCE
THE RECEPTOR-LIKE KINASE SERK3/BAK1 IS A CENTRAL REGULATOR OF INNATE IMMUNITY IN PLANTS	171	PLANT & ANIMAL SCIENCE
PLANT CELLS RECOGNIZE CHITIN FRAGMENTS FOR DEFENSE SIGNALING THROUGH A PLASMA MEMBRANE RECEPTOR	164	PLANT & ANIMAL SCIENCE
CERK1, A LYSM RECEPTOR KINASE, IS ESSENTIAL FOR CHITIN ELICITOR	155	PLANT & ANIMAL

SIGNALING IN ARABIDOPSIS		SCIENCE
A BACTERIAL VIRULENCE PROTEIN SUPPRESSES HOST INNATE IMMUNITY TO CAUSE PLANT DISEASE	140	PLANT & ANIMAL SCIENCE
THE ARABIDOPSIS RECEPTOR KINASE FLS2 BINDS FLG22 AND DETERMINES THE SPECIFICITY OF FLAGELLIN PERCEPTION	129	PLANT & ANIMAL SCIENCE
BACTERIAL EFFECTORS TARGET THE COMMON SIGNALING PARTNER BAK1 TO DISRUPT MULTIPLE MAMP RECEPTOR-SIGNALING COMPLEXES AND IMPEDE PLANT IMMUNITY	116	MICROBIOLOGY
A LYSM RECEPTOR-LIKE KINASE PLAYS A CRITICAL ROLE IN CHITIN SIGNALING AND FUNGAL RESISTANCE IN ARABIDOPSIS	114	PLANT & ANIMAL SCIENCE
A PSEUDOMONAS SYRINGAE EFFECTOR INACTIVATES MAPKS TO SUPPRESS PAMP-INDUCED IMMUNITY IN PLANTS	113	MICROBIOLOGY
PSEUDOMONAS SYRINGAE EFFECTOR AVRPTO BLOCKS INNATE IMMUNITY BY TARGETING RECEPTOR KINASES	103	BIOLOGY & BIOCHEMISTRY
A BACTERIAL E3 UBIQUITIN LIGASE TARGETS A HOST PROTEIN KINASE TO DISRUPT PLANT IMMUNITY	98	PLANT & ANIMAL SCIENCE
PHYTOPATHOGEN TYPE III EFFECTOR WEAPONRY AND THEIR PLANT TARGETS	87	PLANT & ANIMAL SCIENCE
A TYPE III EFFECTOR ADP-RIBOSYLATES RNA-BINDING PROTEINS AND QUELLS PLANT IMMUNITY	87	PLANT & ANIMAL SCIENCE
RESISTANCE PROTEINS: MOLECULAR SWITCHES OF PLANT DEFENCE	87	PLANT & ANIMAL SCIENCE
TYPE III EFFECTOR AVRPTOB REQUIRES INTRINSIC E3 UBIQUITIN LIGASE ACTIVITY TO SUPPRESS PLANT CELL DEATH AND IMMUNITY	82	PLANT & ANIMAL SCIENCE
BREAKING THE BARRIERS: MICROBIAL EFFECTOR MOLECULES SUBVERT PLANT IMMUNITY	81	PLANT & ANIMAL SCIENCE
FROM GUARD TO DECOY: A NEW MODEL FOR PERCEPTION OF PLANT PATHOGEN EFFECTORS	81	PLANT & ANIMAL SCIENCE
THE ARABIDOPSIS SOMATIC EMBRYOGENESIS RECEPTOR-LIKE KINASE1 PROTEIN COMPLEX INCLUDES BRASSINOSTEROID-INSENSITIVE1	81	PLANT & ANIMAL SCIENCE
INDIRECT ACTIVATION OF A PLANT NUCLEOTIDE BINDING SITE-LEUCINE-RICH REPEAT PROTEIN BY A BACTERIAL PROTEASE	78	PLANT & ANIMAL SCIENCE
PSEUDOMONAS SYRINGAE EFFECTOR AVRPTOB SUPPRESSES BASAL DEFENCE IN ARABIDOPSIS	74	PLANT & ANIMAL SCIENCE
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A DRAFT GENOME SEQUENCE OF PSEUDOMONAS SYRINGAE PV. TOMATO T1 REVEALS A TYPE III EFFECTOR REPERTOIRE SIGNIFICANTLY DIVERGENT FROM THAT OF PSEUDOMONAS SYRINGAE PV. TOMATO DC3000	52	PLANT & ANIMAL SCIENCE
THE COILED-COIL AND NUCLEOTIDE BINDING DOMAINS OF THE POTATO RX DISEASE RESISTANCE PROTEIN FUNCTION IN PATHOGEN RECOGNITION AND SIGNALING	43	PLANT & ANIMAL SCIENCE
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RAPID HETEROMERIZATION AND PHOSPHORYLATION OF LIGAND-ACTIVATED PLANT TRANSMEMBRANE RECEPTORS AND THEIR ASSOCIATED KINASE BAK1	34	BIOLOGY & BIOCHEMISTRY
ONE FOR ALL: THE RECEPTOR-ASSOCIATED KINASE BAK1	34	PLANT & ANIMAL SCIENCE
INTERFAMILY TRANSFER OF A PLANT PATTERN-RECOGNITION RECEPTOR CONFERS BROAD-SPECTRUM BACTERIAL RESISTANCE	30	BIOLOGY & BIOCHEMISTRY
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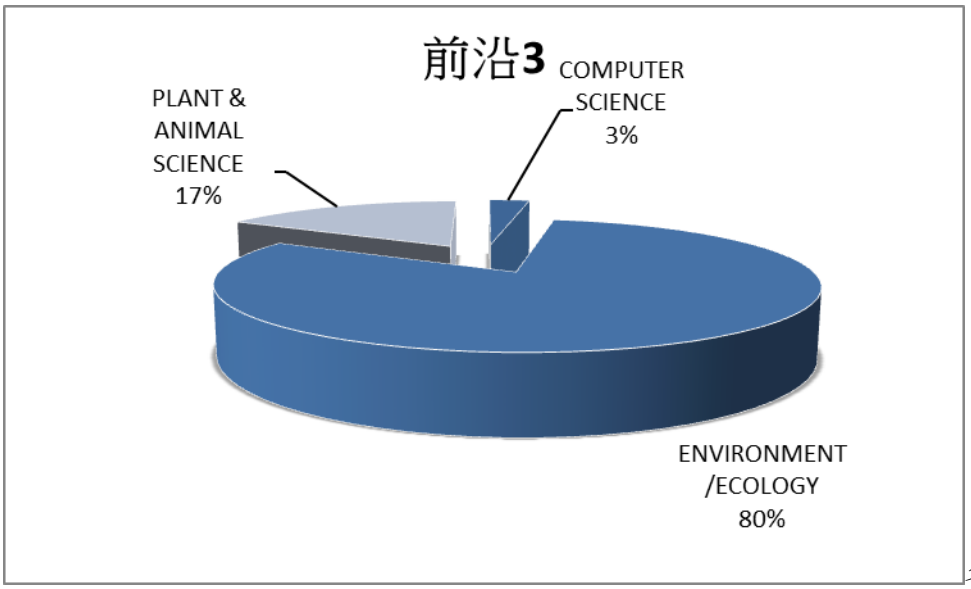
TWO LYSM RECEPTOR MOLECULES, CEBIP AND OSCERK1, COOPERATIVELY REGULATE CHITIN ELICITOR SIGNALING IN RICE	16	PLANT & ANIMAL SCIENCE

PEPR2 IS A SECOND RECEPTOR FOR THE PEP1 AND PEP2 PEPTIDES AND CONTRIBUTES TO DEFENSE RESPONSES IN ARABIDOPSIS	16	PLANT & ANIMAL SCIENCE
RANGAP2 MEDIATES NUCLEOCYTOPLASMIC PARTITIONING OF THE NB-LRR IMMUNE RECEPTOR RX IN THE SOLANACEAE, THEREBY DICTATING RX FUNCTION	10	PLANT & ANIMAL SCIENCE
SPECIFIC THREONINE PHOSPHORYLATION OF A HOST TARGET BY TWO UNRELATED TYPE III EFFECTORS ACTIVATES A HOST INNATE IMMUNE RECEPTOR IN PLANTS	9	MICROBIOLOGY
A RECEPTOR-LIKE CYTOPLASMIC KINASE PHOSPHORYLATES THE HOST TARGET RIN4, LEADING TO THE ACTIVATION OF A PLANT INNATE IMMUNE RECEPTOR	9	MICROBIOLOGY
NUCLEOCYTOPLASMIC DISTRIBUTION IS REQUIRED FOR ACTIVATION OF RESISTANCE BY THE POTATO NB-LRR RECEPTOR RX1 AND IS BALANCED BY ITS FUNCTIONAL DOMAINS	9	PLANT & ANIMAL SCIENCE
DIFFERENT ROLES OF ENHANCED DISEASE SUSCEPTIBILITY1 (EDS1) BOUND TO AND DISSOCIATED FROM PHYTOALEXIN DEFICIENT4 (PAD4) IN ARABIDOPSIS IMMUNITY	7	PLANT & ANIMAL SCIENCE

動植物前沿三

ASYMMETRIC COEVOLUTIONARY NETWORKS; BIODIVERSITY MAINTENANCE; GRASSLAND COMMUNITIES REQUIRES HIGHER BIODIVERSITY; FUNCTIONAL BIODIVERSITY RESEARCH; BIODIVERSITY EFFECTS; BIODIVERSITY IMPROVES WATER QUALITY IN PLANT & ANIMAL SCIENCE



各分類領域比例圖

核心文獻清單

核心文獻標題	Citation	分類領域
EFFECTS OF BIODIVERSITY ON THE FUNCTIONING OF TROPHIC GROUPS AND ECOSYSTEMS	334	ENVIRONMENT/ECOLOGY
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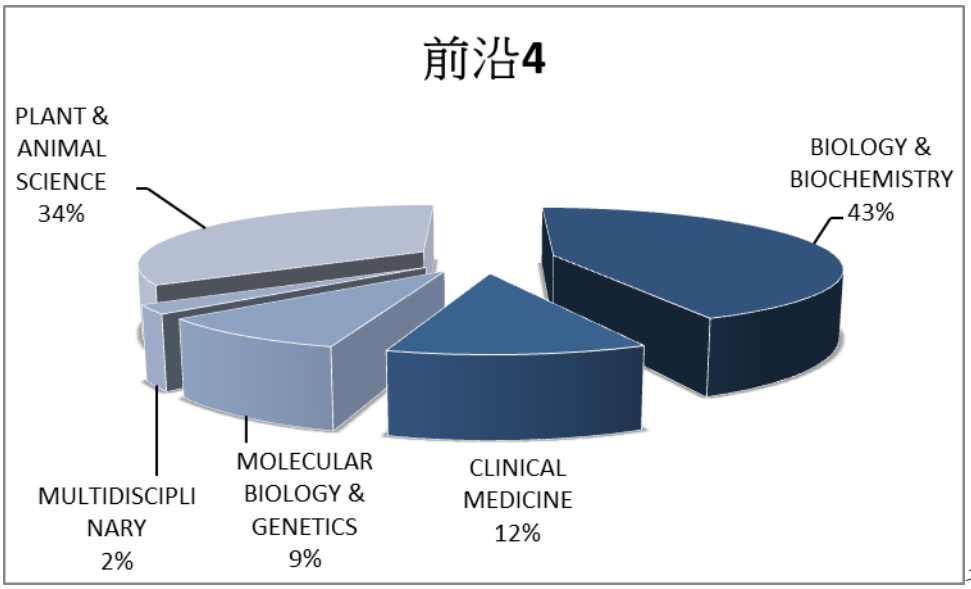
ZINC-FINGER NUCLEASES; ENGINEERED ZINC-FINGER NUCLEASES; ENGINEERED ZINC FINGER NUCLEASES; DESIGNED ZINC-FINGER NUCLEASES; CUSTOM-DESIGNED ZINC FINGER NUCLEASES IN PLANT & ANIMAL SCIENCE



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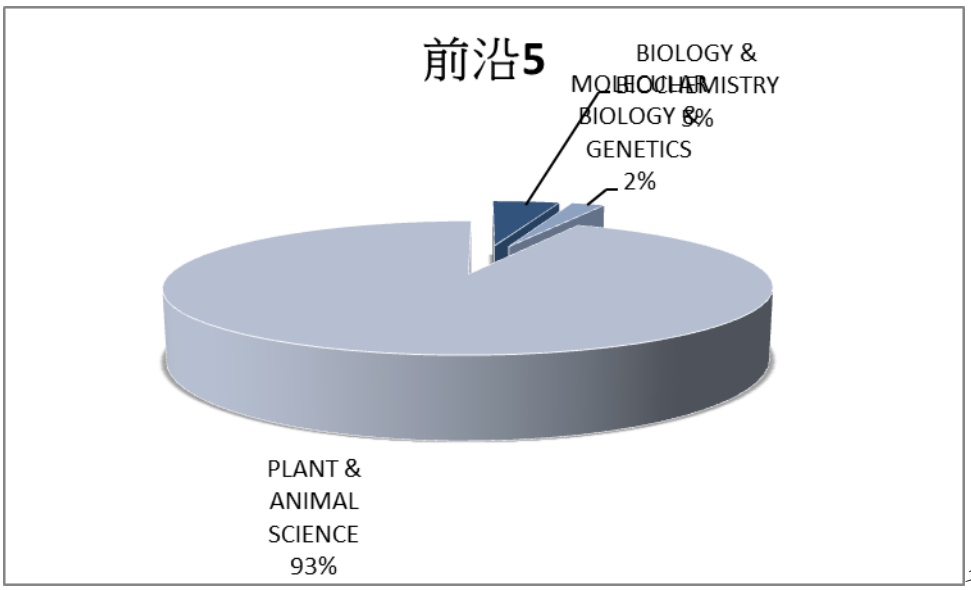
TYPE 2C PROTEIN PHOSPHATASES; ABSCISIC ACID-ACTIVATED PROTEIN KINASES; ABSCISIC ACID INHIBITS TYPE 2C PROTEIN PHOSPHATASES; ABSCISIC ACID SIGNALING IN-VIVO; ABSCISIC ACID RECEPTOR PYR1; ABSCISIC ACID RECEPTOR PYL5 IN PLANT & ANIMAL SCIENCE



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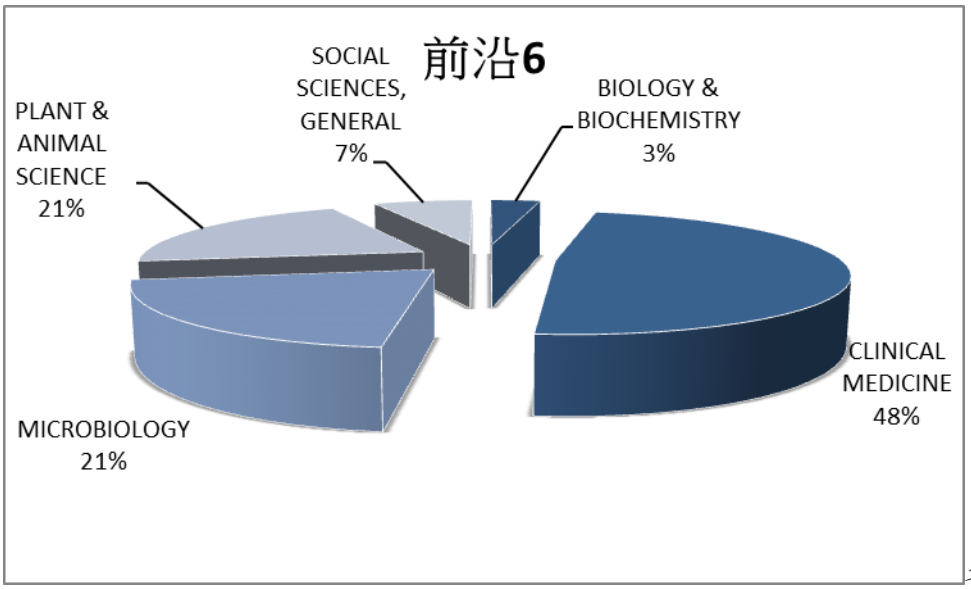
GREAT NEGLECTED TROPICAL DISEASES; SOIL-TRANSMITTED HELMINTH INFECTIONS; HUMAN HELMINTH INFECTIONS; COPROANTIGEN REDUCTION TEST (CRT) PROTOCOL; NATIONWIDE SCHOOL-BASED HELMINTH CONTROL IN PLANT & ANIMAL SCIENCE



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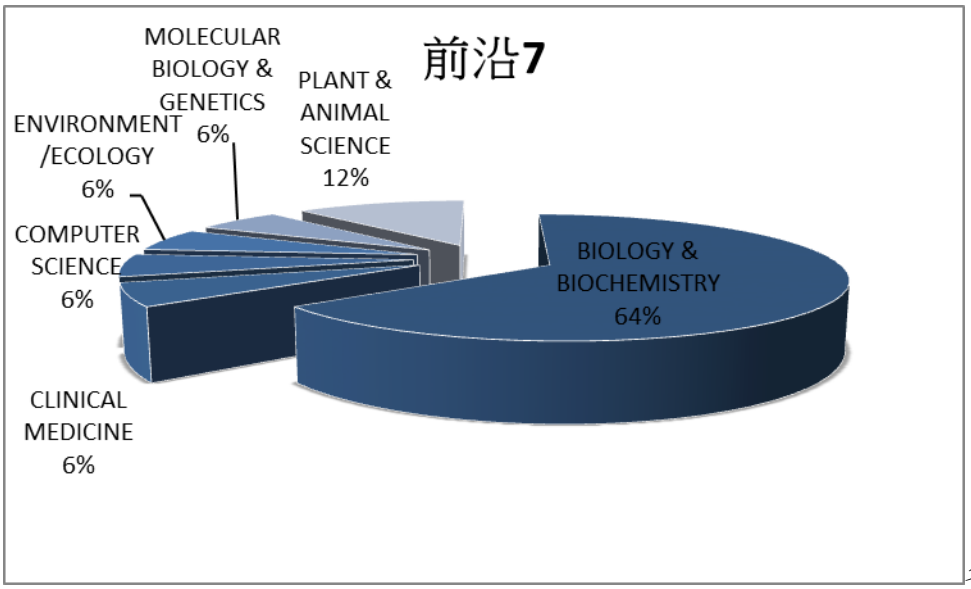
ARTHROPOD PHYLOGENY; SEA ANEMONE GENOME REVEALS ANCESTRAL EUMETAZOAN GENE REPERTOIRE; ARTHROPOD PHYLOGENY REVISITED; ARTHROPOD RELATIONSHIPS REVEALED; PROTEIN-CODING NUCLEAR GENE SEQUENCE IN PLANT & ANIMAL SCIENCE



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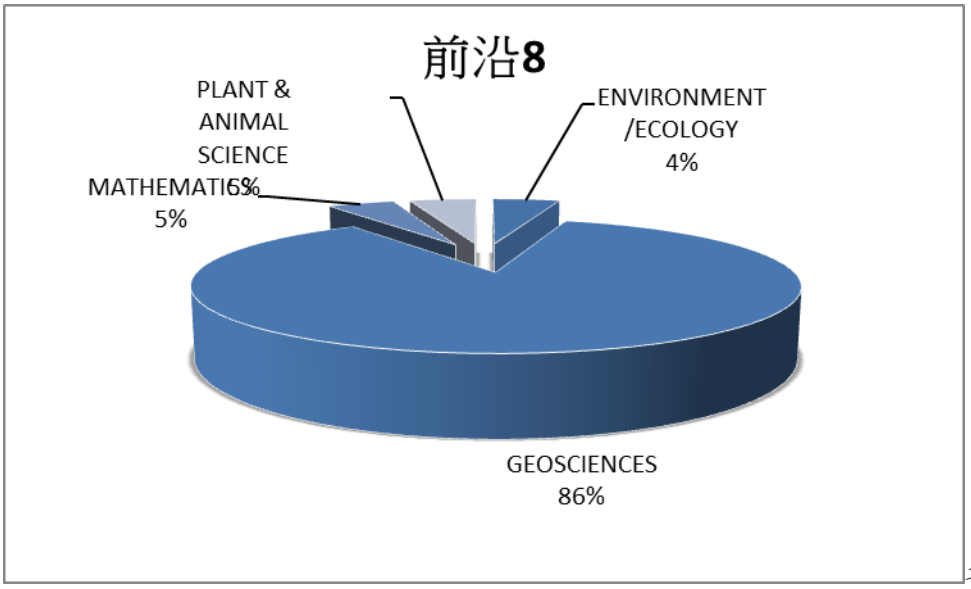

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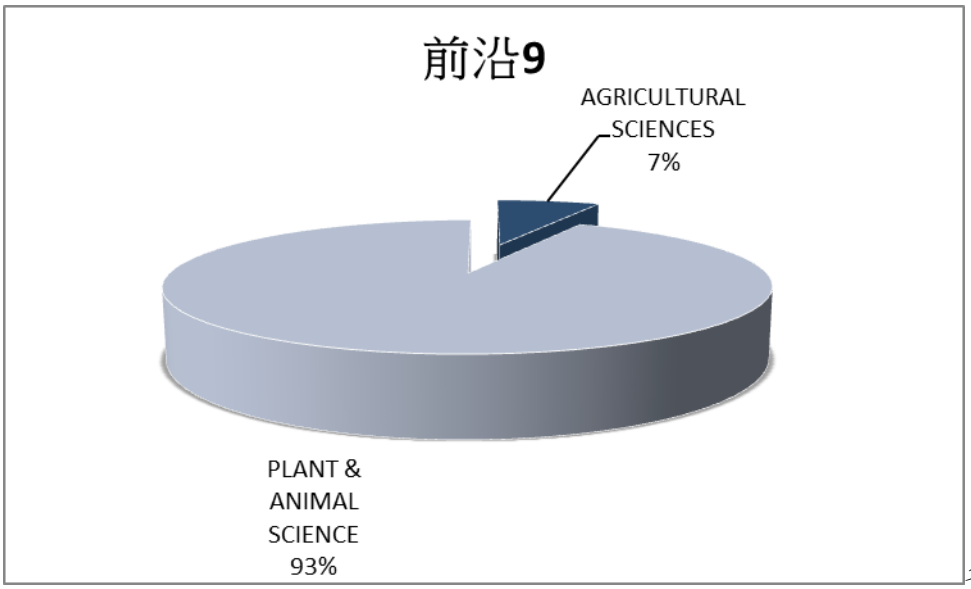
MODEL GRASS BRACHYPODIUM DISTACHYON; GRASS GENOME EVOLUTION; BARLEY GENOME; GENOME SEQUENCING; GRAPEVINE GENOME SEQUENCE SUGGESTS ANCESTRAL HEXAPLOIDIZATION IN PLANT & ANIMAL SCIENCE



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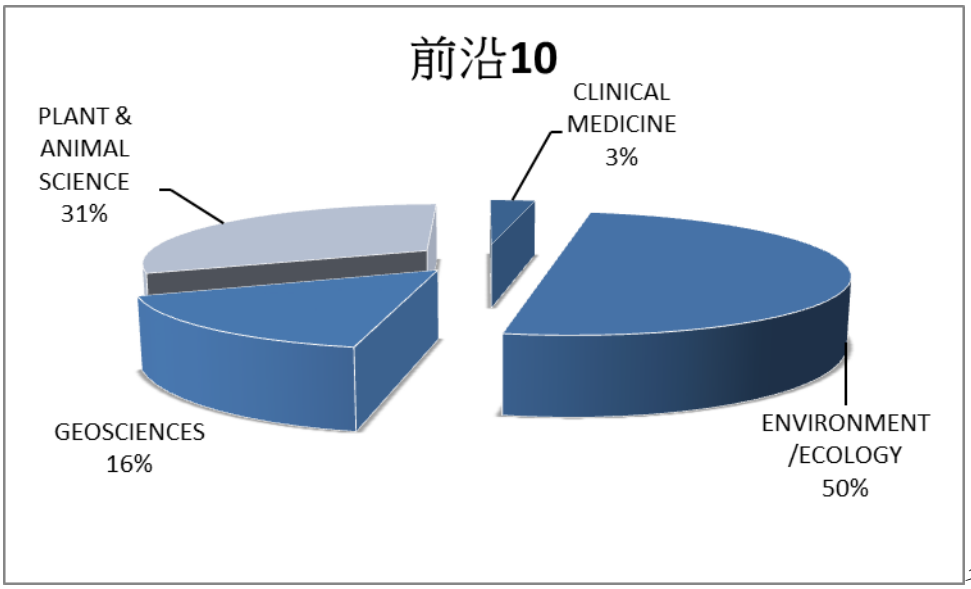

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