

SIR FRANK MACFARLANE BURNET, OM, AK, KBE

弗兰克·麦克法兰·伯内特爵士
英国功劳勋章、澳大利亚骑士勋
章、第二等高级英帝国勋爵士

NOBEL PRIZE FOR MEDICINE 1960
1960年诺贝尔医学奖获得者



Sir Frank Macfarlane Burnet is considered to be the greatest scientist Australia has produced. His legacy is significant, with breakthroughs in our understanding of infectious diseases and the immune system, and for his contribution to disease prevention and treatment in many different settings.

Early beginnings

Sir Frank Macfarlane Burnet studied medicine at the University of Melbourne and soon after was appointed a senior resident in pathology at the Walter and Eliza Hall Institute of Medical Research (WEHI). In 1926 he travelled to London where he worked at the Lister Institute of Preventive Medicine at the University of London and returned to Melbourne in 1928 taking up the role of assistant-director. He undertook a two-year fellowship at the National Institute for Medical Research in London (1932-33) and for the next 25 years devoted his life to the study of viruses that threaten people and animals, principally influenza.

Director of the Walter and Eliza Hall Institute of Medical Research (WEHI)

Burnet was appointed Director of WEHI in 1944 and served in this capacity for 21 years. He studied how invisible virus particles attached themselves to the bacterial host cell and how they grew inside it, finally bursting the cell and releasing a brood of progeny into the growth medium.

Burnet examined specific problems from a broad biological and evolutionary viewpoint. Starting at his base in the ecology of human infectious diseases, he branched out into fields such as population genetics, human biology, cancer and ageing.

The decision by Burnet in 1957 to switch to immunology has come to be seen as a master-stroke. Burnet investigated theories of antibody formation and became more convinced that existing theories were wrong. Finding a better theory became a magnificent obsession.

弗兰克·麦克法兰·伯内特爵士被认为是澳大利亚历史上最伟大的科学家；他在人类理解传染病和免疫系统方面取得的突破，为不同环境下的疾病预防与治疗做出了不朽贡献，他留下的遗产可谓意义重大。

早期岁月

弗兰克·麦克法兰·伯内特爵士在墨尔本大学攻读医学，很快被任命为沃尔特伊丽莎医学研究院病理学高级住院医师。1926年，他前往伦敦并在伦敦大学李斯特预防医学研究院学习数年，1928年返回墨尔本，担任副院长一职。他在伦敦英国国家医学研究院做了两年研究员（1932-33），此后25年间，他全身心投入威胁人类和动物的病毒研究，主要研究流感。

沃尔特伊丽莎医学研究院院长

1944年，伯内特被任命为沃尔特伊丽莎医学研究院院长，并担任此职21年。他研究超视病毒粒子如何附着细菌宿主细胞、如何在细胞里生长、最后破裂细胞并在生长介质中排卵。

伯内特从广泛的生物与进化角度研究特定问题，他的研究从人类传染病生态学基础开始，并逐步涉足人口遗传学、人体生物学、癌症与衰老等领域。

1957年，伯内特决定将工作重心转移到免疫学，结果证明此举十分明智。随着对抗体生成理论的研究，伯内特越发相信既有理论是错误的。找到更好的理论成为了他的执着追求。

Nobel Prize Winning Discovery

Together with Frank Fenner in 'The Production of Antibodies (1949)', he made the prediction that was to win him the 1960 Nobel Prize in physiology or medicine. Burnet argued that if a foreign substance were introduced into an embryonic animal, before its immune system had matured properly, the antigen would 'trick' the body into accepting the relevant molecule or molecules as 'self' rather than 'not-self'. As a result, no antibody would be formed, even when the antigen was introduced later in life. This phenomenon, which came to be termed immunological tolerance, was validated in 1953 by (Sir) Peter Medawar (who shared the Nobel prize with Burnet), Rupert Billingham and Leslie Brent.

Burnet's clonal selection theory, published in the Australian Journal of Science in 1957 set the agenda for much of immunology research over the next fifteen years. He considered clonal selection to be his most important scientific contribution.

A passionate commitment to ideas

Burnet was passionately committed to the world of ideas and had the extraordinary gift of being able to take apparently unconnected observations, forge a link between them, pose the next question and, during his heyday as a bench-scientist, design the next deceptively simple experiment to create a new paradigm.

Although Burnet retired at 66, he produced a remarkable thirteen books on a wide range of topics including virology, immunology, human biology, ethics and philosophy. Sir Frank Macfarlane Burnet died on 31 August 1985.

Situated in Melbourne, Australia, the Burnet Institute is named in Burnet's honour and continues his legacy. The Institute's mission is to use science to improve the health of resource-poor and vulnerable communities in Australia and internationally by integrating research, education, and public health.

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获诺贝尔奖的重大发现

伯内特与弗兰克·芬奈尔合作发表《抗体生成》(1949)一文后,他就预言该文将为他赢得1960年诺贝尔生理学或医学奖。伯内特指出,在动物胚胎免疫系统发育成熟之前,如果将外来杂质植入体内,抗原会“哄骗”胚体将相关分子或分子群接纳为“自我”,而不是“非自我”。结果,即便是在生命后期有抗原植入,也不会有抗体形成。这一后来定名为免疫耐受的现象于1953年得到了彼特·梅达瓦(爵士)(与伯内特共享诺贝尔奖)、鲁伯特·比林汉姆和莱斯利·布伦特的验证。

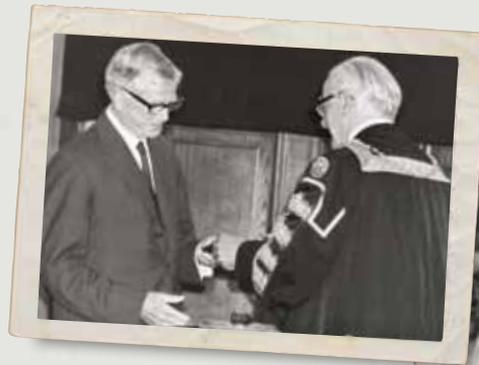
伯内特的克隆选择学说于1957年在《澳大利亚科学杂志》上发表,为之后15年时间的免疫学研究确定了大方向。他认为克隆选择是他对科学的最大贡献。

对概念和公共问题的执着

伯内特将满腔热忱投入概念世界,他拥有非凡的天赋,能够通过观察在看似毫不相关的事物之间找到联系,提出下一个研究问题;作为实验室科学家的鼎盛时期,设计的未来实验看似简单,却能创造新的范式。

虽然伯内特66岁退休,他出版的著作多达13部,涉及包括病毒学、免疫学、人体生物学、伦理学和哲学在内的多个主题。弗兰克·麦克法兰·伯内特爵士于1985年8月31日逝世。

伯内特医学研究院位于澳大利亚墨尔本,以其姓名命名研究院,是为了纪念他的成就并继承他的遗志。本院的使命是,融研究、教育和公共卫生于一体,用科学提高澳大利亚及全球资源贫乏及弱势群体的健康水平。



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