行政院所屬各機關出國報告

出國類別：出席國際會議

出席家畜生物科技對醫學及生命科學貢獻之國際會議

服務機關：行政院農業委員會畜產試驗所
出國人員職稱：副研究員兼組長
姓名：陳立人
出國地點：紐西蘭奧克蘭市
出國其期間：2003 年 1 月 9 日到 1 月 18 日
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報告名稱:

出席家畜生物科技對醫學與生命科學貢獻之國際會議

主辦機關:

行政院農業委員會畜產試驗所

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陳立人　行政院農業委員會畜產試驗所　生理組　副研究員兼組長

出國類別: 其他

出國地區: 紐西蘭

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分類號/目: F10／畜牧業　F10／畜牧業

關鍵詞: 國際胚移置學會，家畜生物科技，國際會議，紐西蘭

內容摘要: 此次在紐西蘭的奧克蘭市所舉辦之會議爲國際胚移置學會〔International Embryo Transfer Society, IETS〕之常年性國際學術研討會。本年專就畜產生物科技之研發與其在醫學與生命科學之應用發展進行深入而廣泛之研討。對於本國未來之畜產生物科技的發展與國際化頗具參考性與指標作用。參與本次會議除發表我國行政院農業委員會畜產試驗所在豬胚幹細胞科技與複製山羊的相關研究成果，以突顯本國畜產生物科技之研發成效外，亦積極與出席之國際級專家學者切磋交流，以深入了解各國之生技發展和進境。

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壹、出國目的

此次在紐西蘭的奧克蘭市所舉辦之會議為國際胚移置學會〔International Embryo Transfer Society, IETS〕之常年性國際學術研討會。本年專就畜產生物科技之研發與其在醫學與生命科學之應用發展進行深入而廣泛之研討。對於本國未來之畜產生物科技的發展與國際化頗具參考性與指標作用。參與本次會議除發表我國行政院農業委員會畜產試驗所在豬胚幹細胞科技與複製山羊的相關研究成果，以突顯本國畜產生物科技之研發成效外，亦積極與出席之國際級專家學者切磋交流，以深入了解各國之生技發展和進境。

貳、訪視過程

一、行程安排

本次出國參與之家畜生物科技對醫學及生命科學貢獻之國際會議係為國際胚移置學會〔International Embryo Transfer Society, IETS〕之常年性國際學術研討會。本（2003）年度的會議由紐西蘭主辦，會議主席為 Takashi Nagai 教授，副主席為 Jorge Piedrahita。會議的地點在奧克蘭市的 Aotea Centre。參與會前會、主會議與會後會所需的報名作業、欲發表報告的摘要提送與審查程序，以來會後參訪畜產生物科技公司的議程與行程安排，皆利用國際胚移置學會所架設的網站（www.iets.org）預先安排妥適。其中，會議的議程如附件一所示。在會前會的部份，這次共有 Successful Publishing in English Language Journals Workshop 與 Symposium on Mechanisms Regulating Developmental Plasticity 二者。因為時間重疊，考量與本次出國之目的後安排報名參加與畜產生物科技之研發有積極關係的 Symposium on Mechanisms Regulating Developmental Plasticity。會後會之 Implementation Challenges of Smart Semen and Embryo Technologies in Cattle 的參與，以及會議後之參訪紐西蘭規模最大的畜產生物科技公司 Livestock

Improvement Corp. 與 AgResearch 等的行程與時間安排皆如附件一與表一所示。

表一、行程安排

日期	行程	活動內容
0109	台南-高雄小港機場（20:25）-中正國際機場	搭乘長榮接駁班機（BR 910）到中正國際機場。
0109-0110	中正國際機場（22:00/0109）-紐西蘭奧克蘭國際機場（14:00/0110）	搭乘長榮班機（BR 361）從中正國際機場到紐西蘭奧克蘭國際機場。隨即到達會議地點 Aotea Centre 報到。
0911	Aotea Centre	參加會前會 Symposium on Mechanisms Regulating Developmental Plasticity
0912-0914	Aotea Centre	出席國際胚移置學會 2003 年年會—家畜生物科技對醫學及生命科學貢獻並以張貼論文海報發表。
0915	Aotea Centre	會後會—Implementation Chellenges of Smart Semen and Embryo Technologies in Cattle

0916	奧克蘭郡	參訪畜產生物科技公司 Livestock Improvement Corp. 與 AgResearch
0917	奧克蘭市	候機
0918	紐西蘭奧克蘭國際機場（10:30）--中正國際機場（17:00）--高雄小港(18:40)--台南(19:30)	搭乘長榮班機（BR 2362）從紐西蘭奧克蘭國際機場到中正國際機場。隨即搭接駁飛機（BR907）到高雄小港機場，再搭車反回台南。

二、內容重點：

（一） 出席會前會 Pre-conference Symposium: Mechanisms Regulating Developmental Plasticity:

此會前會係專門針對目前在畜產生物科技研發中最重要的二個主題—幹細胞科技與複殖科技做深入的討論。從 1 月 11 日早上 08:45 時到 17:30 的議程裡，係由複殖羊桃莉的研究 PI，英國羅莎冷研究所的研究員 Wilmut 博士擔任主持人，並邀請國際在此二課題之專家學者分別發表論文（如表二所示）。

表二、 Agenda of Pre-conference Symposium: Mechanisms Regulating Developmental Plasticity

時間	論文題目	演講者
0845-0945	Chromatin Dynamics and regulation of gene expression	N. Beaujean
0945-1015	Coffee Break	
1015-1115	Chromatin in cloned embryos	J. P. Renard
1115-1215	New approaches to de-differentiation/trans-differentiation	
1215-1300	Lunch Break	
1300-1400	Therapeutic cloning	R. Jaenisch
1400-1500	Cloned mice	A. Ogura
1500-1530	Coffee Break	
1530-1630	Human ES cells	M. Carpenter
1630-1730	Perspectives on adult stem cells	M. Bhatia

（二） 出席國際胚移殖學會年會：

1. 2003 年在紐西蘭的奧克蘭舉辦的國際胚移殖學會年會係以「家畜生物科技對醫學及生命科學貢獻」為主軸，在 1 月 12 日到 15 日的議程當中，以邀請學者進行口頭發表的部份共分為六個主題，分別為「基礎科學論題」、「人工生殖科技 1」、「人工生殖科技 2」、「基因轉殖科技」、「商品化的發展」與「馬、綿羊與山羊胚移殖科技的發展現況」。總共有 37 位學者就這些主題發表相關研究論文（題目與演講者如附件二所示）。
2. 會中也安排兩個以海報發表的主題時段，即依海報的編

號分別於 13 日與 14 日請發表人貼上海報並進行解說答詢二小時，海報則需一直貼到會議結束後方可撤除。海報發表也次分為數個主題，即「人工授精」、「複殖與細胞核轉殖科技」、「冷凍保存與冷凍生物學」、「發生生物科學」、「早期懷孕與懷孕診斷」、「胚體外培養」、「胚操縱」、「胚移置」、「幹細胞科技」、「疾病與流行病學」、「濾泡與卵子發生學」、「基因表現」、「體外成熟與體外受精」、「雄性生理學」、「顯微構造分析」、「卵母細胞致活」、「卵母細胞成熟」、「性別鑑定」、「精子注入」、「超量排卵」、「組織培養」、「基因轉殖」、「超音波呈像學」與「研究生論文競賽」等。與會發表的海報總共有 336 篇。本人攜去發表的海報摘要如附件三與四所示。

（三） 出席會後會 Implementation Challenges of Smart Semen and Embryo Technologies in Cattle：

此於 1 月 15 日召開的會後會乃針對乳牛胚移製國際商業用途的推展工作中所遭遇到的困難做廣泛與深入的討論。利用胚的國際間買賣，並利用胚移置引進優良種源以加速乳牛的遺傳改進速度的行為，由於國際間對於狂牛症的恐懼，以及對於這種引種方式會不會帶入疾病並沒有絕對的保證。因此，

在各國的檢疫門坎不同調下，實際上也有不少的困難。會中均針對這些問題在各國與會人員間做現況與意見的討論，並決定對於胚的處理訂定一致的規範，以利國際間優良乳牛種原的交換與買賣等商業業務的推展。

（四）參訪紐西蘭奧克蘭郡的畜產生物科技公司

1月16日在國際胚移置學會的安排下，參訪紐西蘭的Livestock Improvement Corp. 與 AgResearch 等兩個畜產生物技公司。Livestock Improvement Corp.位於漢米爾敦，該公司透過歷史約60年的努力以及與紐西蘭酪農業的密切合作，已建立起號稱全世界最優的牧野酪農業體系。該公司與紐西蘭的乳協合作，為全國 98%的乳牛場建立各種育種紀錄、後裔測定、乳樣分析、DNA 分析等資料，並提供疾病控制與經營管理的咨詢服務，同時也研發並推廣牛冷凍精液與人工授精，對於紐西蘭酪農業的發展有很大的影響。比較起來，AgResearch 位於 Ruakura 的研究中心（為 AgResearch 在紐西蘭五個研究中心最大的一個）的業務重點則是落在新興生物科技的研發上，將近 200 人的研究團隊負責有關乳牛的研究，包括分子遺傳和內分泌對繁殖能力的控制、人工生殖科技、胚胎發生學、複製與基因轉殖科技、功能性基因體與、懷孕建立等，

其產品包括有各類的懷孕診斷套組、合成激性腺素、培養基、以及帶有酪蛋白基因的複製牛。

參、 心得

一、 本（第 29）屆國際胚移置學會在紐西蘭奧克蘭市召開，以「家畜生物科技對醫學及生命科學貢獻」為主題之國際會議共發表口頭論文報告 37 篇，以貼海報解說發表的論文共有 336 篇，總計 373 篇。參與論文發表的各國學者專家總計有 1128 人，出席會議的人員在 500 人以上，畜產生物科技的研發在國際間蓬勃發展的情況由此可見一斑。會議中發表之直接與複製動物科技有關的論文有 75 篇(10 篇口頭發表與 65 篇海報展示)，佔所有發表論文數的 20.1%(其中口頭發表 27.0%，海報展示 19.3%)。若包括卵母細胞致活、細胞核內基因重整與表現、以及利用複製技術產製基因轉殖動物等與複製動物操作之主題相關的論文，則其所佔的比率約可達總發表論文數的三分之一左右。足見「複製動物科技」在國際間受到重視的程度，以及各國於此主題下所投入的人力、物力等研究資源與量能之鉅大。今年的會議中，家畜禽幹細胞的研究為會前會的討論重點，但由於這個研究主題在未來有關細胞組織移植醫療與再生醫學上的商機很大，與會的各國專家學者的訊息交換都僅限於其所發表的成果，除此之外任何進一步的訊息都不願意透露。

二、 這次年會因為恰好碰到美國的雷格爾教派宣稱其已成功地複製人類並有複製嬰兒出生，讓舉辦國非常緊張。會議全程對於出入會場人員的管制都不見任何的鬆懈，會場內更有安全人員不斷地穿梭巡視，並檢視會場內人員的識別證。主辦國對於與會人員安全防護鉅細靡遺的認真與落實執行直到最後一刻的態度，並且不妨礙會議進行的流暢性之掌握，讓人印象十分深刻。

三、 由與會人士之眾且分布於產官學研之廣、發表論文質量之豐，可以期望畜產生物科技的研發不論在畜產業本身的發展或是在人類醫療生技的研發上都十分具有潛力與前景。也是因為這個發展的潛力可能會帶來很大的商機，在許多關鍵性的機制與研發成果的資訊交換上，各國的專家總是多向對方試探而本身卻語多保留。我國如果希望在相關的研究上獲致第一手的研究資訊，大底僅能從透過國際合作或交換研究人員的方式來進行。

四、 雖然畜產生物科技的進展已到達可以複製動物與基因修改的成效，但是目前應用的最廣泛、已經高度商業化的，還是人工授精與胚移置這兩種人工生殖科技。紐西蘭的生技公司目前也都鎖定此二技術做為業務的重點，在配合生物

資訊往與育種制度的操作下，對於紐西蘭的酪農業的產能提升與畜群改良已經有很顯著的成效。紐西蘭的畜產生技公司對於酪農業的服務是有收費的方式，而酪農業者的密切配合態度也是成功的要素。他們彼此間的互動關係與產業網絡的建制都很值得我國的產官學研界做為借鏡。

五、 這次年會雖然是以學術研究為主軸，但在畜產生物科技的商業化方面也有專門的研討主題。各國除了研究人員外，也多有商業人士參與，並且在會中就其推展相關商業業務上遭遇到的問題提出與與會的學者專家討論，以供與會人員集思廣益尋求解決之道，或做為學界研究的參考。我國出席該會議僅本人一人，限於對國際商業實務的了解有限，對於該專題討論所提出討論的問題僅能以學術研究的角度切入而無法以商業業者的角度去了解，殊為可惜。

肆、 建議

（一）國際胚移置學會在 1974 年成立以來會員數穩定成長並廣布於全球，到目前會員人數已超過 1500 人。每年在各國舉辦的年會出席的人員都在 500 人上下。學會的刊物 Theriogenology 在生殖科技界已躋身領導地位的學術性期刊之列。因此，該學會對於畜產研發與國際組織如 OIE 的影響力也日益顯著。近年來的年會主題中，畜產生物科技相關的論文發表比重越來越高，已經儼然成為國際胚移置學會會員的研究主軸。我國畜產業定調在以生物科技帶領產業的永續經營與發展，似應對於此這個國際學會的發展軌跡與方向投以持續的關注，並且鼓勵國內畜產業的產官學研界多加主動參與—不論在加入會員的人數上、派員出席年會、在年會中提出研究論文發表等各方面，都應該更積極以提升我國相關研究的國際能見度，掌握畜產生物科技研發的國際脈動，進而爭取該國際會議到我國舉辦的機會以提升我國畜產研發和產業的國際水平。是故建議我國在每年的年會應該多派畜產生物科技的研究人員參與並發表論文，且應該也多鼓舞畜產生物

科技業者積極出席，以掌握商機與商業發展的方向。

（二）綜觀國際胚移置學會的論文發表題目與數量，可以發現國際的畜產生物科技未來的研發方向，將是以動物複製、基因轉殖與幹細胞科技等三個重點為主軸。此次於會議中，本人代表出席所發表的有關動物複製與胚幹細胞科技研發的成果，雖然受到不少的重視並反映之我國在這方面的研究水平而得到注目。但在觀察到各國學術界與生技業者都卯足勁積極投入此三個方向的同時，我國之畜產生物科技的研發雖然亦朝此方向努力，但是在資金、人力的投資上，仍然相對地十分困窘，若依舊以如此研究量能的投入，日後在這方面的研發是否仍然可以跟的上國際間高度的競爭，為我國的畜產生物科技在國際間爭取一個生存的空間？為了我國畜產生物科技的發展以及帶領畜產業、畜產生物科技業的國際化與永續經營，建議我國相關單位應該在這幾個研究重點做更多的研究量能的投注。

（三）為掌握畜產生物科技的研發資訊，建議我國應就上述三個研究重點方向多派員做國際學術交流與留學生，以得到最新最詳盡的資訊和訓練並儲備研發人力。另

一方面，我國在電子期刊的應用上目前只限於部份的大專院校，這對於在資訊累積與傳遞極為迅速，且競爭十分激烈的生技發展現況中，新近研究成果的即時獲知會有時間上的落差，對於國內的研究者相當不利。是故建議由國科會進行統合各院校與試驗研究機構在電子期開的需求並與相關的提供廠商洽辦，以編列預算購得上網查詢與下載的權限，並開放給全國的學研界使用。

（四）對岸在派員出席類似的國際會議的總是以團隊計數，而我國在強調生物科技發展的同時，出席重要的國際生技學術會議的人數卻總是寥寥可數。同時，在各國重要的生技研發機構與學校中，常見到有對岸派出的留學生，而我國卻在限制研究人員留學進修的經費與人數。在這樣的消長下，對於我國需有知識密集的生物科技發展實在很不利。是故，在考量我國生技發展的未來之下，建議有關單位在派員參與相關的國際學術會議以及研究人員赴國外進修方面的經費編列，應該多予支持與加強。

附件一

Calendar of Events (Times and Locations)

All events at the Aotea Centre unless otherwise specified

Thursday, January 9, 2003

10:00-18:00	Carlton Hotel	IETS Board of Governors Annual Meeting

Friday, January 10, 2003

08:00-17:00	Carlton Hotel	IETS Board of Governors Annual Meeting
18 00-20 00	Level 3	Registration –Pre-Registrants only, Onsite registrations will start Saturday morning
17:00-21 00	Kaikoura Room	Research Subcommittee of the Companion Animal, Non-Domestic & Endangered Species (CANDES) Committee
17:00-21:00	Goodman Fielder Room	Technology Subcommittee of the Companion Animal, Non-Domestic & Endangered Species (CANDES) Committee

Saturday, January 11, 2003

07:00-18 30	Level 3	Registration
08:00-17 00	Hauraki Room	Pre-Conference—Successful Publishing in English Language Journals Workshop
08·00-16:30	Kupe Room	Pre-Conference Symposium on Mechanisms Regulating Developmental Plasticity
09:00-12:00	Goodman Fielder Room	Regulatory Subcommittee of the Health And Safety Advisory Committee (HASAC)
10:00-18:00	Level 5	Commercial Exhibit Set-up
13:30-17:00	Goodman Fielder Room	IETS Foundation Board of Trustees Annual Meeting
14:00-17:00	Kaikoura Room	Research Subcommittee of the Health And Safety Advisory Committee (HASAC)
17·00-19 00	Kaikoura Room	Forms and Certificates Subcommittee, Health And Safety Advisory Committee (HASAC)
17:00-21:00	Goodman Fielder Room	Technology Subcommittee of the Companion Animal, Non-Domestic & Endangered Species (CANDES) Committee
17:00-21:00	Hauraki Room	Health & Safety Subcommitte of the Companion Animal, Non-Domestic & Endangered Species (CANDES) Committee

Sunday, January 12, 2003

07·00-18:30	Level 3	Registration
07:30-10:00	Level 2	Poster Set-up
07:30-08:30	Carlton Hotel	Past Presidents Breakfast
08:00-10:00	Goodman Fielder Room	Open meeting of the Companion Animal, Non-Domestic & Endangered Species (CANDES) Committee
09:00-12:00	Kaikoura Room	Food Safety Subcommittee of the Health And Safety Advisory Committee (HASAC)
07 30-18:30	Mercury Energy Room	Speaker Preparation Room
07 30-18 00	Mercury Energy Room	Audio-Visual Library
07:30-08.15	Kaikoura Room	Student Competition Breakfast with Foundation
08:00-12:00	Hauraki Room	Successful Publishing in English Language Journals Workshop
08.30-10·00	VIP Room	Foundation Education Committee
09·00-18:00	Level 5	Commercial Exhibits
10:00-10:30	ASB Theatre	Welcome (Powhiri) and Introduction
10.30-12:00	ASB Theatre	**Session I**: Fundamental Aspects
12:00-13:00		Lunch Break
13:00-14.30	ASB Theatre	**Session II**: Assisted Reproductive Technologies I
14:30-15 00	Level 5	Refreshments and Exhibitors
16 30-17·00	Level 5	Break and Exhibits

15:00-16:30	ASB Theatre	**Session III**: Assisted Reproductive Technologies II
17:00-18:30	ASB Theatre	Student Competition Presentations
19:00	Keilhers	Conference Dinner (Buses leaving fromCarlton and Centra hotels at 6:30pm)

Monday, January 13, 2003

07:30-16:00	Level 3	Registration
07:30-18:30	Mercury Energy Room	Speaker Preparation Room
07:30-16:00	Mercury Energy Room	Audio-Visual Library
08:00-09:00	Goodman Fielder Room	IETS Data Retrieval Committee Meeting
08:00-18:00	Level 5	Commercial Exhibits
09:00-11:00	ASB Theatre	**Session IV**: Transgenic Technology
11:00-11:30	Level 5	Refreshments and Exhibitors
11:30-12:00	ASB Theatre	Presentation of the IETS Pioneer Award
12:00-13:00		Lunch Break
13:00-13:15	ASB Theatre	A report from the IETS Data Retrieval Committee
13:15-14:45	ASB Theatre	**Session V**: Commercialization
14:45-16:15	Level 2&3	**Poster Session I**, presentation by authors of 'even' numbered abstracts in Theriogenology 2003; 59(1) and the Student Competition finalist poster presentations
16:15-17:00	ASB Theatre	IETS Annual Business Meeting
17:00-18:30	ASB Theatre	Practitioner's Forum
19:00	Kaikoura Room	Open Meeting of the Health And Safety Advisory Committee (HASAC)

Tuesday, January 14, 2003

07:00-09:00	Goodman Fielder Room	Organizational Meeting of the IETS Board of Governors
07:30-16:00	Level 3	Registration
07:30-18:30	Mercury Energy Room	Speaker Preparation Room
07:30-16:00	Mercury Energy Room	Audio-Visual Library
08:00-15:00	Level 5	Commercial Exhibits
08:30-10:00	Level 2&3	**Poster Session II**, presentation by authors of 'odd' numbered abstracts in Theriogenology 2003; 59(1)
09:00-10:00	Goodman Fielder Room	Organizational Meeting of the IETS Foundation Board of Trustees
10:00-10:30	ASB Theatre	Presentation of Student Competition Awards
10:30-11:00	Level 5	Refreshments and Exhibitors
11:00-11:40	ASB Theatre	A report from the HASAC Committee
11:40-12:10	ASB Theatre	A report from the CANDES Committee
12:10-13:10		Lunch Break
13:10-15:10	ASB Theatre	**Session VI**: Current Status of Embry Technologies in horses, sheep and deer
15:10-15:40	ASB Theatre	Presentation of the Distinguished Service Award
15:40-15:50	ASB Theatre	Closing Presentation
15:00-19:00	Level 2	Poster Teardown
15:00-19:00	Level 5	Commercial Exhibit Teardown

Wednesday, January 15, 2003

09:00-16:45	ASB Theater	Post-conference Symposium: Implementation Challenges of Smart Semen and Embryo Technologies in Cattle
19:00	Aotea Centre	Symposium Dinner

Thursday, January 16, 2003

08:00-17:00		Industry Field Trip to Livestock Imporvement Corp. and AgResearch (buses leave from outside the Aotea Centre)
18:30		1st Annual IETS Triathalon

附件二

Main Scientific Program

Theme: The contribution of animal biotechnology to medical and life sciences

Sunday, January 12, 2003

8:00-10:00 Open meeting of the Companion Animal, Non-Domestic & Endangered Species (CANDES) Committee

10:00-10:30 Welcome and Introduction

Session I: Fundamental Aspects
Session Chairs: Keith Campbell and Poul Hyttel

10:30-11:00 Gene Expression and Chromatin Structure in Pre-Implantation Embryo.
Jiri Kanka, Academy of Science, Czech Republic

11:00-11:30 Mammalian Epigenomics: Reprogramming the Genome for Development and Therapy
Wendy Dean, The Babraham Institute, UK

11:30-12:00 Nuclear Reprogramming of Cloned Embryos Produced In Vitro.
Young-Mahn Han, Korean Research Institute of Bioscience and Biotechnology, Korea

12:00-13:00 Lunch

Session II: Assisted Reproductive Technologies I
Session Chairs: Chang Kyu Lee and Xianghong (Jerry) Yang

13:00-13:30 Coordination Between Donor Cell Type and Cell Cycle State Improves Nuclear Cloning Efficiency in Cattle
D.N. Wells, AgResearch, New Zealand

13:30-14:00 Bringing Up Small Oocytes to Eggs in Pigs and Cows.
Takashi Miyano, Kobe University, Japan

14:00-14:30 Short Communication Papers chosen from Abstracts

Epigenetic Characteristics of Nuclear Transfer Donor Cells In Vitro: Effect of Histone Acetylation
B.P Enright and X.C. Tian (Poster #45)

Effect of Cell Confluence Using Embryonic Stem Cells for the Production of Cloned Mice
S. Gao, M. McGarry, T. Ferrier, B. Pallante, B. Gasparrini, J. Fletcher, L. Harkness, P. A. De Sousa, J. McWhir, and I. Wilmut (Poster #47)

Long-Lasting Physiological Disorders Exhibited by Mouse from Nuclear Transfer
Q. Zhou, A. Jouneau, V. Brochard, C. Fremond, B. Ryffel, and J.P. Renard (Poster #90)

14:30-15:00 Refreshments and Exhibitor Showcase

Session III: Assisted Reproductive Technologies II
Session Chairs: Teruhiko Wakayama and Ian Wilmut

15:00-15:30 Prospects for Spermatogenesis In Vitro.
John E. Parks, Cornell University, USA

15:30-16:00 New Microinsemination Techniques for Laboratory Animals.
Atsuo Ogura, The Institute of Physical and Chemical Research (RIKEN), Bioresource Center, Japan

16:00-16:30 Short Communication Papers chosen from Abstracts

Birth of a Normal Calf After Transfer of the Defective Oocyte from Old Infertile Cattle After Germinal Vesicle Transfer
M. Kuwayama (Poster #62)

Microinsemination with First-Wave Spermatogenic Cells from Immature Male Mice
H. Miki, N. Ogonuki, K. Inoue, Y. Yamamoto, Y. Noguchi, K. Takano, K. Mochida, and A. Ogura (Poster #317)

Normality of Calves Resulting from Sexed Sperm
L.M. Tubman, Z. Brink, T.K. Suh, and G.E. Seidel, Jr. (Poster #313)

16:30-17:00 Breck and Exhibitor Showcase

17:00-18:30 **IETS Foundation Student Competition Presentations**
Chairman: Curt Youngs, USA

Effect of Macromolecules for Bovine Oocyte Vitrification
C.M. Checura and G.E. Siedel, Jr. (Poster #1)

Oxygen-Regulated Gene Expression in Bovine Blastocyts
A.J. Harvey, K.L. Kind, and J.G. Thompson (Poster #2)

Sex-Sorting and Re-Cryopreservation of Frozen-Thawed Ram Sperm for In Vitro Embryo Production
F.K. Hollinshead, G. Evans, W.M.C. Maxwell, and J.K. O'Brien (Poster #3)

Reduction of Polysermic Penetration After Temporary Arrest of In Vitro-Matured Metaphase I Pig Oocytes
A. Kidson, L. Schreier, M.M. Bevers, B. Colenbrander, and J.R. Dobrinsky (Poster #4)

Effect of the 1:29 Robertsonian Translocation on the Segreation and In Vitro Development of Bovine Blastocysts
F. Ménétrey, F. Le Gal, L. Hasan, S. Neuenschwander, and G.F. Stranzinger (Poster #5)

Duration of Cryopreservation has no Effect on Fertilizing Ability of Board Spermatozoa
K.A. Stroble, T.S. Stewart, and R.L. Krisher (Poster #6)

19:00 **Conference Dinner**

Monday, January 13, 2003

Session IV: Transgenic Technology
Session Chairs: Karen Moore and Mark Nottle

9:00-9:30 Development of Efficient Strategies for the Production of Genetically Modified Pigs.
Hiroshi Nagashima, Meiji University, Japan

9:30-10:00 Artificial Chromosome Vectors and Expression of Complex Proteins in Transgenic Animals.
Jim Robl, Hematech LLC, USA

10:00-10:30 Transgenic Swine for Biomedicine and Agriculture.
Randall Prather, University of Missouri-Columbia, USA

10:30-11:00 Short Communication Papers chosen from Abstracts

Use of Adeno-Associated Virus for Transfection of Male Germ Cells for Transplantation In Pigs
A. Honaramooz, S. Megee, B. Foley, and I. Dobrinski (Poster #332)

RNA Interference of Green Fluorescent Protein Gene in Mouse Embryos By Injection of Long/Short Dsrnas into Cytoplasm or Pronucleus
M. Hosoe, T. Furusawa, M. Sakatani, T. Tokunaga, R.M. Schultz, and M. Takahashi (Poster #216)

Rodent Model of Gene and Cell Transplantation to Fetal Rat Liver by In-Utero Manipulation for Fetal Therapy
T. Mitani, S. Enosawa, N. Takahashi, N. Sakuragawa, and S. Suzuki (Poster #333)

11:00-11:30 Refreshments and Exhibitor Showcase

11:30-12:00 Presentation of IETS Pioneer Award

12:00-13:00 Lunch

Session V: Commercialization
Session Chairs: Tanja Dominko and Steve Stice

13:15-13:45 Commercialization of Animal Biotechnology.
David Faber, Trans Ova Genetics, USA

13:45-14:15 New Commercial Opportunities for Advanced Reproductive Technologies in Horses, Wildlife, and Companion Animals.
Charles R Long, Genetics Savings and Clone, USA

14:15-14:45 Short Communication Papers chosen from Abstracts

Evidence for Hybrid Vigor by Nuclear-Cytoplasmic Interaction in Cultured Cells from Transmitochondrial Cloned Bovine Fetuses
S. Hiendleder, K. Prelle, K. Brüggerhoff, H. Wenigerkind, H.-D. Reichenbach, M. Stojkovic, S. Müller, G. Brem, V. Zakhartchenko, and E. Wolf (Poster #51)

Nuclear Transfer in Horses
I. Lagutina, G. Crotti, S. Colleoni, N. Ponderato, R. Duchi, G. Lazzari, and C. Galli
(Poster #63)

Source of Fetus Determines Efficiency of Production of Nuclear Transfer Jersey Cattle Genetically Engineered to Resist Mastitis
A.M. Powell, N.C. Talbot, K.D. Wells, D.E. Kerr, V.G. Pursel, and R.J. Wall (Poster #75)

14:45-16:15 **Poster Session I**, presentation by authors of 'even' numbered abstracts in Theriogenology 2003; 59(1) and the Student Competition finalist poster presentations, (Aotea Centre, Levels 2 & 3)

16:15-17:00 IETS Annual Business Meeting

17:00-18:30 **Practitioner's Forum of the 2003 International Embryo Transfer Society**
Session Chair: Charles R. Looney, OvaGenix, Bryan, Texas, USA
- *Synopsis of Continuous Plagues of Bovine Embryo Transfer*
- *Discussion of Semen Quality and Its Affect on Fertilization Rate*
- *Inconsistencies Observed in Direct Transfer Pregnancy Rates*

19:00 Open Meeting of the Health And Safety Advisory Committee (HASAC)

Tuesday, January 14, 2003

8:30-10:00 **Poster Session II**, presentation by authors of 'odd' numbered abstracts in Theriogenology 2003; 59(1), (Aotea Centre, Levels 2 & 3)

10:00-10:30 Presentation of Student Competition Awards

10:30-11:00 Refreshments and Exhibitor Showcase

11:00-11:40 Trade and Societal Constraints in national and international embryo movements: the purpose of HASAC, a report of IETS HASAC.
M. Thibier and D. S. Stringfellow

11:40-12:10 CANDES Committee Update.
N. Loskutoff

12:10-13:10 Lunch

Session VI: Current Status of Embryo Technologies in horses, sheep and deer
Session Chairs: Jeremy Thompson and Robin Tervit

13:10-13:40 Embryo Technologies in the Horse.
E.L. Squires, Colorado State University, USA

13:40-14:10 Current status of Embryo Technologies in Sheep and Goat.
Y. Cognie, INRA, France

14:10-14:40 New Reproductive Technologies for Deer.
Debra K. Berg, AgResearch, New Zealand

14:40-15:10 Short Communication Papers chosen from Abstracts

Temporal Effect of IGF-I on Nuclear and Cytoplasmic Maturations in Equine Oocytes
G.F. Carneiro and I.K.M. Liu (Poster #280)

Effect Of Vitamin B12 on the In Vitro Maturation and Development of Ovine Oocytes
L.M. Mitchell, M.E. Staines, and T.G. McEvoy (Poster #141)

Increased In Vitro Development Rates of Sheep Somatic Cell Nuclear Transfer Embryos Produced by `Reverse-Order' Zona-Free Method
T. T. Peura, S. R. Rudiger, G. Vajta, and S. K. Walker (Poster #74)

15:10-15:40 Presentation of the Distinguished Service Award

15:40-15:50 Closing Presentation

附件三

EFFECTS OF THE CULTURE PERIOD AND PASSAGE NUMBER ON THE CAPACITY OF CHIMERA PARTICIPATION OF INNER CELL MASS DERIVING CELLS FROM PORCINE EMBRYOS

Y.L. Shiue[1], J.D. Lee[2], S.M. Lee[2], and L.R. Chen[2]

[1]Institute of Biomedical Sciences, National Sun Yat-sen University, Kaohsiung 804, Taiwan, ROC, [2]Department of Animal Physiology, Taiwan Livestock Research Institute, COA, Tainan 712, Taiwan, ROC

Mammalian embryonic stem (ES) cells are pluripotent cells derived from inner cell mass (ICM) of the blastocyst [Evans and Kaufman, Nature 1981;292:154–156]. Under suitable conditions, S cells are able to proliferate continuously without differentiation in vitro. Their capacity of pluripotency in differentiation will be resumed when they are reintroduced into embryos, and then they will contribute to the embryonic development to form a chimeric individual. This ex vivo manipulation of S cells mainly established from the studies of the mouse. However, porcine ICM-derived cell lines, even possessed similar cellular morphology and in vitro behavior to those of murine S cells, had a less efficiency in chimera formation when reintroduced into the embryos [Anderson et al., Theriogenology 1994;42:204–212; Chen et al., Theriogenology 1999;52:195–212]. This study was undertaken to determine the influences of the passage number and the duration of in vitro culture on the capacity of porcine ICM-derived cells from Meisan pigs in participation of chimeric embryo formation with host blastocysts of the same breed. Clumps of ICM-derived cells with 10–15 cells each at different culturing periods (2, 4, and 6 days after passage) of different passages (0, 6th, 9th, 12th, and 15th) were labeled with 0.6 mg/ml fluorescein isothiocyanate (FITC, Butcher C and Weissman IL, J Immunol Methods 1980;37:97–108] and then subjected to blastocyst injection. The integration of FITC-labeled ICM-derived cells into the ICM of the host blastocysts was determined under a fluorescence microscope 48 h after injection. The results showed that the number of passage had no detrimental effects on the integration ability of porcine ICM-derived cells up to the 15th passage ($P > 0.05$). However, elongating the culture period up to 6 days in each passage would impair the capacity of porcine ICM-derived cells to integrate into the ICM of the host blastocyst ($P < 0.05$). Therefore, the culture period of the porcine ICM-derived cells in each passage should not be longer than 4 days if high efficiency of chimera production was to be achieved.

附件四

THE EFFECT OF ELECTRICAL FIELD STRENGTH FOR ACTIVATION ON DEVELOPMENT OF CAPRINE NUCLEAR TRANSFER EMBRYOS CLONED FROM ADULT EAR CELLS

P.C. Shen[1], S.N. Lee[1], J.S. Wu[1], J.C. Huang[1], F.H. Chu[1], C.C. Chang[1], J.C. Kung[1], H.H. Lin[1], L.R. Chen[1], and W.T.K. Cheng[2]

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Activation conditions used in nuclear transfer (NT) procedure is one of the many critical factors affecting the efficiency of animal cloning. The purpose of this study was to investigate the effect of electrical field strength used for activation on the developmental capacity of caprine NT embryos that cloned from the fibroblast cells derived from an adult Alpine doe. Reconstituted embryos were obtained by transfer and electrical fusion of the quiescent ear-derived fibroblast cells at their 4th passage to the enucleated metaphase II (M II) oocytes. Activation of those NT embryos with either electrical field strength of 1.67 or 2.33 kV/cm was then performed at 4–5 h after fusion. Cleavage rate of the NT embryos activated with 2.33 kV/cm following incubation by 6-DMAP was significantly higher than those with 1.67 kV/cm following incubation by 6-DMAP after in vitro culture for 18 h (65.6% versus 19.6%, $P < 0.001$). No pregnancy was found after transfer of 51 NT embryos activated with 1.67 kV/cm to 14 recipient does In contrast, two of seven recipients became pregnant and gave birth to three kids after embryo transfer of 61 NT embryos activated with 2 33 kV/cm. Body weight of these three kids at birth were within the normal range of typical Alpine goats. However, one kid died at 1 h after birth, the remaining two appeared normal and healthy so far. DNA analysis by polymerase chain reaction single-strand conformation polymorphism confirmed that these three NT kids obtained were genetically identical to their nuclear donor. The results demonstrated that activation induced by an increased electrical field could enhance the cleavage and the subsequent development capacity to term of reconstituted caprine embryos.