

Open

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.

FORM APPROVED
OMB NO. 0579-0036

**ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)**

2. HEAR
inclu 15-R-0002, Cust Id 266
(b)(6), (b)(7)(C)
RHODE ISLAND HOSPITAL
593 EDDY STREET
PROVIDENCE, RI 02903

tered with USDA

NOV 14 2000

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation, or held for these purposes. Attach additional sheets if necessary.)

FACILITY LOCATIONS (Sites)

Buildings: Middle House 4th & 5th

Aldrich 4th & 5th

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS FORM 7023A)

| A. Animals Covered By The Animal Welfare Regulations | B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes. | C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs. | D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used. | E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report). | F. TOTAL NO. OF ANIMALS (Cols. C + D + E) |
|--|---|---|---|---|---|
| 4. Dogs | 0 | 0 | 0 | 0 | 0 |
| 5. Cats | 0 | 0 | 29 | 0 | 29 |
| 6. Guinea Pigs | 0 | 0 | 81 | 0 | 81 |
| 7. Hamsters | 0 | 0 | 64 | 0 | 64 |
| 8. Rabbits | 0 | 0 | 22 | 0 | 22 |
| 9. Non-human Primates | 0 | 0 | 0 | 0 | 0 |
| 10. Sheep | 0 | 0 | 0 | 0 | 0 |
| 11. Pigs | 0 | 0 | 188 | 0 | 188 |
| 12. Other Farm Animals | | | | | |
| 13. Other Animals | | | | | |

ASSURANCE STATEMENTS

- 1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual research, teaching, testing, surgery, or experimentation were followed by this research facility.
- 2) Each principal investigator has considered alternatives to painful procedures
- 3) This facility is adhering to the standards and regulations under the Act, and it has required that exceptions to the standards and regulations be specified and explained by the principal investigator and approved by the Institutional Animal Care and Use Committee (IACUC). A summary of all such exceptions is attached to this annual report. In addition to identifying the IACUC-approved exceptions, this summary includes a brief explanation of the exceptions, as well as the species and number of animals affected
- 4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

**CERTIFICATION BY HEADQUARTES RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)**

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

SIGNATURE OF C.E.O. OR INSTIT

DATE SIGNED

11/4/00

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.
15-R-0003

FORM APPROVED
OMB NO. 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

NOV 30 2011

2. HEADQUARTERS RESEARCH FACILITY (Name and Address, as registered with USDA include Zip Code)

15-R-0003
(b)(6), (b)(7)(C)
BROWN UNIVERSITY
34 OLIVE ST., BOX G-F287
PROVIDENCE, RI 02912

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, sheets if necessary)

FACILITY LOCATIONS (Sites)

Animal Care Facility
BioMedical Center
Dept. of Psychology
Hunter Laboratories

Animal Care Facility
Medical Research Laboratories

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS FORM 7023A)

| A. Animals Covered By The Animal Welfare Regulations | B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes. | C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs. | D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used. | E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report) | F. TOTAL NO OF ANIMALS (Cols. C + D + E) |
|--|---|---|---|--|--|
| 4. Dogs | -- | 2 | 25 | ----- | 27 |
| 5. Cats | -- | --- | 33 | ----- | 33 |
| 6. Guinea Pigs | -- | --- | 0 | ----- | 0 |
| 7. Hamsters | -- | --- | 0 | ----- | 0 |
| 8. Rabbits | 3 | --- | 72 | ----- | 72 |
| 9. Non-human Primates | -- | --- | 14 | ----- | 14 |
| 10. Sheep | -- | 5 | 82 | ----- | 87 |
| 11. Pigs | -- | --- | 35 | ----- | 35 |
| 12. Other Farm Animals | -- | --- | --- | ----- | 0 |
| Goats | -- | --- | 3 | ----- | 3 |
| 13. Other Animals | -- | --- | --- | ----- | 0 |
| Bats | 2 | --- | 2 | ----- | 2 |
| | | | | | |
| | | | | | |

ASSURANCE STATEMENTS

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- 4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

CERTIFICATION BY HEADQUARTES RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

SIGNATURE OF C.E.O. OR INSTITUTIONAL OFFICIAL

NAME & TITLE OF C.E.O. OR INSTITUTIONAL OFFICIAL (Type or Print)

DATE SIGNED

11/29/10

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.

FORM APPROVED
OMB NO. 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

2. HEAD ^{includ} 15-R-0005. Cust Id 269

MIRIAM HOSPITAL, THE
164 SUMMIT AVENUE
PROVIDENCE, RI 02906

NOV 14 2000
Filed with USDA

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation, or held for these purposes. Attach additional sheets if necessary.)

FACILITY LOCATIONS (Sites)

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS FORM 7023A)

| A. Animals Covered By The Animal Welfare Regulations | B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes | C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs | D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used | E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report.) | F. TOTAL NO. OF ANIMALS (Cols. C + D + E) |
|--|--|--|--|---|---|
| 4. Dogs | 0 | 0 | 0 | 0 | 0 |
| 5. Cats | 0 | 0 | 0 | 0 | 0 |
| 6. Guinea Pigs | 0 | 0 | 0 | 0 | 0 |
| 7. Hamsters | 0 | 0 | 0 | 0 | 0 |
| 8. Rabbits | 0 | 0 | 0 | 0 | 0 |
| 9. Non-human Primates | 0 | 0 | 0 | 0 | 0 |
| 10. Sheep | 0 | 0 | 0 | 0 | 0 |
| 11. Pigs | 0 | 0 | 0 | 0 | 0 |
| 12. Other Farm Animals | 0 | 0 | 0 | 0 | 0 |
| 13. Other Animals | | | | | |

ASSURANCE STATEMENTS

- 1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual research, teaching, testing, surgery, or experimentation were followed by this research facility.
- 2) Each principal investigator has considered alternatives to painful procedures.
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- 4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

CERTIFICATION BY HEADQUARTES RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

SIGNATURE OF C.E.O.

DATE SIGNED

11/2/00

gpr

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.

FORM APPROVED
OMB NO 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

2. HEAC
includ 15-R-0014, Cust Id 272

ered with USDA

ETHIDE LABORATORIES, INC.
91 HILL FARM ROAD
COVENTRY, RI 02816

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation, or held for these purposes. Attach additional sheets if necessary.)

FACILITY LOCATIONS (Sites)

Animal Lab

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS FORM 7023A)

| A. Animals Covered By The Animal Welfare Regulations | B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes. | C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs. | D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used. | E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report.) | F. TOTAL NO. OF ANIMALS (Cols. C + D + E) |
|--|---|---|---|---|---|
| 4. Dogs | | | | | |
| 5. Cats | | | | | |
| 6. Guinea Pigs | | | | | |
| 7. Hamsters | | | | | |
| 8. Rabbits | 3 | 2 | | | 2 |
| 9. Non-human Primates | | | | | |
| 10. Sheep | | | | | |
| 11. Pigs | | | | | |
| 12. Other Farm Animals | | | | | |
| 13. Other Animals | | | | | |

ASSURANCE STATEMENTS

- 1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual research, teaching, testing, surgery, or experimentation were followed by this research facility.
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- 4) The attending veterinarian for this research facility has appropriate authority to ensure the provision of adequate veterinary care and to oversee the adequacy of other aspects of animal care and use.

CERTIFICATION BY HEADQUARTER'S RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

SIGNATURE OF CEO OR INSTITUTIONAL OFFICIAL

DATE SIGNED

11-8-00

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.

FORM APPROVED
OMB NO. 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

2. HEADQUARTERS RESEARCH FACILITY (Name and Address, as registered with USDA)

incl 15-R-0018, Cust Id 1771

DOMANI, INC.
1334 MAIN ROAD
TIVERTON, RI 02878

APR 2000

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation sheets if necessary.)

s. Attach additional

FACILITY LOCATIONS (Sites)

None - Facility not in use

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS FORM 7023A)

| A. Animals Covered By The Animal Welfare Regulations | B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes. | C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs. | D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used. | E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report). | F. TOTAL NO. OF ANIMALS (Cols. C + D + E) |
|--|---|---|---|---|---|
| 4. Dogs | | | | | 0 |
| 5. Cats | | | | | 0 |
| 6. Guinea Pigs | | NONE | | | 0 |
| 7. Hamsters | | | for | | 0 |
| 8. Rabbits | | | | ALL | 0 |
| 9. Non-human Primates | | | | | 0 |
| 10. Sheep | | | | | 0 |
| 11. Pigs | | | | | 0 |
| 12. Other Farm Animals | | | | | 0 |
| 13. Other Animals | | | | | 0 |

ASSURANCE STATEMENTS

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CERTIFICATION BY HEADQUARTERS RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

SIGNATURE OF C.E.O. OR INSTITUTIONAL OFFICIAL

NAME & TITLE OF C.E.O. OR INSTITUTIONAL OFFICIAL (Type or Print)

DATE SIGNED

9/19/00

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.

15-R-0019

FORM APPROVED
CMB NO. 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

2. HEADQUARTERS RESEARCH FACILITY (Name and Address, as registered with USDA, include Zip Code)

Nemogen, Inc.
4 Richmond Square, 4th Floor
Providence, RI 02906

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation, or held for these purposes. Attach additional sheets if necessary.)

FACILITY LOCATIONS (Sites)

Same address

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHIS FORM 7023A)

| A. Animals Covered By The Animal Welfare Regulations | B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes. | C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs. | D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used. | E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report). | F. TOTAL NO OF ANIMALS (Cols. C + D + E) |
|--|---|---|---|---|--|
| 4. Dogs | 0 | 0 | 0 | 0 | 0 |
| 5. Cats | 0 | 0 | 0 | 0 | 0 |
| 6. Guinea Pigs | 0 | 0 | 0 | 0 | 0 |
| 7. Hamsters | 0 | 0 | 0 | 0 | 0 |
| 8. Rabbits | 0 | 0 | 0 | 0 | 0 |
| 9. Non-human Primates | 0 | 0 | 0 | 0 | 0 |
| 10. Sheep | 0 | 0 | 0 | 0 | 0 |
| 11. Pigs | 0 | 0 | 0 | 0 | 0 |
| 12. Other Farm Animals | 0 | 0 | 0 | 0 | 0 |
| 13. Other Animals | | | | | |

ASSURANCE STATEMENTS

- 1) Professionally acceptable standards governing the care, treatment, and use of animals, including appropriate use of anesthetic, analgesic, and tranquilizing drugs, prior to, during, and following actual research, teaching, testing, surgery, or experimentation were followed by this research facility.
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CERTIFICATION BY HEADQUARTERS RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)

I certify that the above is true, correct, and complete (7 U.S.C. Section 2143)

DATE SIGNED

10/24/00

REC

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ATP

This report is required by law (7 USC 2143). Failure to report according to the regulations can result in an order to cease and desist and to be subject to penalties as provided for in Section 2150.

See reverse side for additional information.

Interagency Report Control No 0180-DOA-AN

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE

1. REGISTRATION NO.

15-R-004⁰

FORM APPROVED
OMB NO. 0579-0036

ANNUAL REPORT OF RESEARCH FACILITY
(TYPE OR PRINT)

2. HEADQUARTERS RESEARCH FACILITY (Name and Address, as registered with USDA
include Zip Code)

C# 268

University of Rhode Island
Carlotti Administration Bldg.
Kingston, RI 02881
M. Beverly Swan, Provost

3. REPORTING FACILITY (List all locations where animals were housed or used in actual research, testing, teaching, or experimentation, or held for these purposes. Attach additional sheets if necessary.) University of Rhode Island

FACILITY LOCATIONS (Site)

REPORT OF ANIMALS USED BY OR UNDER CONTROL OF RESEARCH FACILITY (Attach additional sheets if necessary or use APHS FORM 7023A)

| A. Animals Covered By The Animal Welfare Regulations | B. Number of animals being bred, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes. | C. Number of animals upon which teaching, research, experiments, or tests were conducted involving no pain, distress, or use of pain-relieving drugs. | D. Number of animals upon which experiments, teaching, research, surgery, or tests were conducted involving accompanying pain or distress to the animals and for which appropriate anesthetic, analgesic, or tranquilizing drugs were used. | E. Number of animals upon which teaching, experiments, research, surgery or tests were conducted involving accompanying pain or distress to the animals and for which the use of appropriate anesthetic, analgesic, or tranquilizing drugs would have adversely affected the procedures, results, or interpretation of the teaching, research, experiments, surgery, or tests. (An explanation of the procedures producing pain or distress in these animals and the reasons such drugs were not used must be attached to this report). | F. TOTAL NO. OF ANIMALS (Cols. C + D + E) |
|--|---|---|---|---|---|
| 4. Dogs | 0 | 0 | 0 | 0 | 0 |
| 5. Cats | 0 | 30 | 0 | 0 | 30 |
| 6. Guinea Pigs | 0 | 0 | 0 | 0 | 0 |
| 7. Hamsters | 72 | 265 | 10 | 0 | 275 |
| 8. Rabbits | 0 | 46 | 5 | 33 | 94 |
| 9. Non-human Primates | 0 | 0 | 0 | 0 | 0 |
| 10. Sheep | 24 | 38 | 1 | 0 | 39 |
| 11. Pigs | 0 | 0 | 2 | 0 | 2 |
| 12. Other Farm Animals | | | | | |
| 13. Other Animals | | | | | |
| White-footed Mice | 145 | 424 | 0 | 0 | 424 |
| Shrews | 0 | 12 | 0 | 0 | 12 |
| Squirrels | 0 | 3 | 0 | 0 | 3 |

ASSURANCE STATEMENTS

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CERTIFICATION BY HEADQUARTERS RESEARCH FACILITY OFFICIAL
(Chief Executive Officer or Legally Responsible Institutional Official)

I certify that the above is true, correct, and complete (7 USC Section 2143)

| | |
|---|-------------|
| NAME & TITLE OF CEO OR INSTITUTIONAL OFFICIAL (Type or Print) | DATE SIGNED |
| | 11/29/00 |

(is obsolete)

PART 1 - HEADQUARTERS

facc

Column E Explanation

University of Rhode Island

1. **Registration Number:** 15-R-0004
2. **Number of animals used in this study:** 33
3. **Species (common name) of animals used in this study:** rabbits
4. **Procedure producing pain and/or distress:**

The rabbits are used as a blood source for ticks. The ticks are placed on the rabbits' ears and each ear is individually wrapped with a stocking material. An Elizabethan collar is used to prevent the rabbit from scratching its ears while the ticks are feeding.

5. **Scientific justification why pain and/or distress could not be relieved. State methods or means used to determine that pain and/or distress relief would interfere with test results:**

Due to the potential interference with tick feeding, no analgesics were used to minimize pain or distress. Maintenance of laboratory strains of ticks necessitates the use of vertebrate hosts. *In vitro* feeding methods have been developed for blood sucking insects such as tsetse flies, mosquitoes, kissing bugs and fleas. However, these arthropods require a blood meal that lasts from just a few seconds to an hour, compared to the tick which remains firmly anchored to the same feeding site for 2-14 days. This considerable investment on the part of the tick is preceded by a stringent cascade for acceptance of an appropriate host and for attachment at a suitable site. The important steps preceding the blood meal of a tick depends on a specific blend of thermal, hydro, mechanical, olfactory and contact chemo stimuli. The tick engorges mainly during the last 24 hours of feeding, with the preceding days allowing for the tick to undergo a variety of physiological changes. All of this renders the tick rather delicate candidates for *in vitro* feeding, as an adequate diet of blood has to be maintained at the feeding site throughout attachment. Several trials to feed ticks through membranes have been carried out without success. There are currently no alternative methods for tick feeding available.