NRC Form 313 I U.S. NUCLEAR REGULATORY COMMISSION (12-81) 10 CFR 30					1. APPLICATION FOR: (Check and/or complete as appropriate)	
	APPLICATION FOR	BYPRODUCT MATERIA	AL LICENSE		a. NEW LICENSE	
See	attached instructions for details.				b. AMENDMENT TO:	
Corri Offic Wast 1711	pleted applications are filed in d e of Nuclea: Material Safety, an lington, DC 20555 or application FH Street, NW, Washington, D. (	uplicate with the Division of Fu d Safeguards, U.S. Nuclear Regi ns may be filed in person at the C, or 7915 Eastern Avenue, Silv	el Cycle and Material Safety, ulatory Commission, Commission's office at er Spring, Maryland	x	c. RENEWAL OF: LICENSE NOMBER 20-17284-01	
2. A	PPLICANT'S NAME (Institution, I linical Science Lab.	firm, person, etc.)	3. NAME AND TITLE OF PERSON TO BE CONTACTED REGARDING THIS APPLICATION			
TE (	EPHONE NUMBER: AREA CON 617) 339-6106	DE - NUMBER EXTENSION	TELEPHONE NUMBER: A (617) 339-6106	REA	CODE - NUMBER EXTENSION	
4. A) (A sh	PPLICANT'S MAILING ADDRES ddress to which NRC corresponde ould be sent.)	S (include Zip Code) nce, notices, builetins, etc.,	5. STREET ADDRESS WHER (Include Zip Code)	ELI	CENSED MATERIAL WILL DE USE	
	51 Francis Ave. Mansfield, MA 0204	.8	51 Francis Ave. Mansfield, MA	020	48	
6. 11	(IF MORE SPACE IS NDIVIDUAL (S) WHO WILL U	S NEEDED FOR ANY ITEM, USE OR DIRECTLY SUPERV	USE ADDITIONAL PROPE	RL)	( KEYED PAGES.) MATERIAL	
	FULL N	AME		7	TLE	
	Stanley G. Elfbaum,	Ph.D.	Technical Co-Dire	cto	r	
b	Louis P. Amoruso, Ph	.D.	Technical Co-Direc	cto	r	
c. 7. R	adiation protection offic Stanley G. Elfbaum,	Ph.D.	Attach a resume of person's tri 16 and 17 and describe his rosp	ain 'r Iorisil	n and experience as outlined in Items bilities under Item 15.	
		8. LICENSEI	D MATERIAL	E FR	MAXIMUM NUMBER OF	
L I N E	ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	AND MODEL NUMBER (If Sealed Source)	L M	MILLICURIES AND/OR SEALED SOURCES AND MAXIMUM ACTI VITY PER SOURCE WHICH WILL JE POSSESSED AT ANY ONE TIM	
NO.	A	В	c	_	D	
(1)	Iodine 125	lodinated proteins and biochemical substances			30	
(2)	Hydrogen 3	and biochemical substances			1.0	
(3)	Iodine 129	sealed source	New England Nuclear (NES-1355)	r	0.000107	
(4)	Iron 59	ces 2		2		
	(5) on additional s	DESCRIBE USE OF I	LICENSED MATERIAL			
(1) (2)	Nonvolatile rad used in routine cl <u>vitro</u> analysis of or animals. Iodin performed.	ioactive materials w inical laboratory ra physiological specim ations of biochemica	will be purchased ma adioassays. Materia mens only. It will al substances using	ost is no Na	ly in "kit" form to be will be used for <u>in</u> t be used on humans 125 F will not be	
1.000		a her and the second state of the second states				

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L-ZWO.	CONTAINER AND/OR DEVICE IN WHICH EACH SEALED SOURCE WILL BE STORED OR USED. A.			NAME OF MANUFACTURER B.		MODEL NUMBER
(1)	When not in u	sources will	be stored ;	in individual		
(2)	lead containe	rs.				
×1.						
3)						
4)						
		10. RA	DIATION DETEC	TION INSTRUM	MENTS	
LINEO	TYPE OF INSTRUMENT	MANUFACTURER'S NAME B	MODEL NUMBER C	NUMBER AVAILABLE D	RADIATION DETECTED (alpha, beta, gamma, neutron) E	SENSITIVITY RANGE (milliroentgens.%our or counts/minute) F
1)	Well scintil- lation spec-	NML	#5000	1	Gamma	
2)	Survey meter (low energy ga	mma Ludlum	#3 #44-3	1	Gamma	10 Kev- 40 Kev
3)	Multi crystal gamma counter	Berthold	LB2103 #1376	1	Gamma	16 Kev- 84 Kev
4)	Multi crystal	Berthold	LB2104	1	Gamma	16 Kev-
-	Bauna courrer	11 CALIER	TION OF INST	UMENTS LISTE	DINITEM 10	1 of net
D	ept.,M.I.T.,Vas	sar St., Cambrid 12. PE	ige,MA RSONNEL MONI	TORING DEVIC	ES	
	(Check and/or complete A	as appropriate.)	6	SUPPLIER Service Company) B		EXCHANGE FREQUENCY
X	1) FILM BADGE		ICN Dosime	try Service		S MONTHLY
j (	2) THERMOLUMINESCI DOSIMETER (TLD)	ENCE				D QUARTERLY
	B) OTHER (Specify):	non motor				OTHER (Specify):
a.	check on perso	nnel			A.Daily	
B.Thyroid check on personnel with survey meter						B.Monthly
	13. FACILITIES A	ND EQUIPMENT (C	heck were approp	riate and attach a	innotated sketch(es)	and description(s).
2	a LABORATORY FAC	ILITIES, PLANT FACIL ES, CONTAINERS, SPE	ITIES, FUME HOO CIAL SHIELDING (	DS (Include filtrat fixed and/or tempo	ion, if any], ETC. trary], ETC.	
	RESPIRATORY PRO	TECTIVE EQUIPMENT	ETC.			
N	AME OF COMMERCIAL	WASTE DISPOSAL SE	14. WASTE	DISPOSAL		
IF BT	COMMERCIAL WASTI E USED FOR DISPOSIN HE APPLICATION IS FO	E DISPOSAL SERVICE I IG OF RADIGACTIVE Y OR SEALED SOURCES	S NOT EMPLOYED VASTES AND ESTI AND DEVICES AN	, SUBMIT A DETA MATES OF THE T D THEY WILL BE	VILED DESCRIPTION ( YPE AND AMOUNT OF RETURNED TO THE M	DF METHODS WHICH WILL F ACTIVITY INVOLVED. IF MANUFACTURER, SO STAT

NRC FORM 313 1 (12-81)

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### INFORMATION REQUIRED FOR ITEMS 15, 16 AND 17

Describe in detail the information required for Items 15, 16 and 17. Begin each item on a separate page and key to the application as follows:

- 15. RADIATION PROTECTION PROGRAM. Describe the radiation protection program as appropriate for the material to be used including the duties and responsibilities of the Radiation Protection Officer, control measures, bioassay procedures (if needed), day-to-day general safety instruction to be followed, etc. If the application is for sealed source's also submit leak tosting procedures, or if leak testing will be performed using a leak test kit, specify manufacturer and model number of the leak test kit.
- 16. FORMAL TRAINING IN RADIATION SAFETY. Attach a resume for each individual named in Items 6 and 7. Describe individual's formal training in the following areas where applicable. Include the name of person or institution providing the training, duration of training, when training was received, etc.
  - a. Principles and practices of radiation protection.
  - Radioactivity measurement standardization and monitoring techniques and instruments.
  - c. Mathematics and calculations basic to the use and measurement of radioactivity.
  - d. Biological effects of radiation.
- 17. EXPERIENCE. Attach a resume for each individual nam 2d in Items 6 and 7. Describe individual's work experience with radiation, including where experience was obtained. Work experience or on-the-job training should be commensurate with the proposed use. Include list of radioisotopes and maximum activity of each used.

19.050	TIEICATE	Log April 1 Remitter Check No. 3174
(This item must be a	ompleted by applicant)	For Catoroly 3P
		Type of hear Renewal Pate Check I and A/4/82 Date Completed - 4/4/82 By: Schemberth
The applicant and any official executing this cent certify that this application is prepared in confort Part 30, and that all information confisined hereit and correct to the best of our knowledge and b WARNING18 U.S.C., Section 1001; Act of June 25, 1948; 62 Sta representation to any department or agency of the United States as	tificate on behalf of the app mity with Title 10, Code of n, including any supplement elief, at. 749, makes it a criminal of to any matter within its jurise	Incant named in Item 2, 101028 Federal Regulations, a attached hereto, is true fense to make a willfully false statement or diction.
*. LICENSE FEE REQUIRED Tsee Section 170.31, 10 CFR 1201 # 1200	b. CERTIFYING OFFICI Stanley c. NAME (Type ) prim STANLEY	G. ELFBANM
11) LICENSE FEE CATEGORY BY PRODUCT MATERIAL 31	A TITLE TECH	CO-DIRECTOR
121 LICENSE FEE ENCLOSED \$ 120	e. DATE 3/19	187
NRC FORM 3131(12-81)	5 PO 886-426	



## 8. Licensed Material

(5) AM 241 sealed source The Nucleus, Inc. 0.000037



11 B.

The survey meter is checked with a standard source on a monthly basis internally and the results are recorded. A battery check and a background determination are performed daily and the results are recorded.

All well scintillation instruments are calibrated with either an Iodine 129 or Americium 241 scaled source on a daily basis. The count rates, settings (if applicable), and percent efficiencies are recorded.

#### FACILITIES AND EQUIPMENT

#### Part 13

- A. Sketch of laboratory facilities enclosed.
- B. Storage Provisions:

Material will be stored either in a freezer or a refrigerator in a restricted laboratory. This laboratory will be locked outside of regular working hours. During regular working hours this laboratory will be unlocked but restricted to all authorized personnel. (See enclosed diagram)

Shielding:

When by-product material is moved from the above storage areas to the working laboratory areas, it will be placed in the laboratory in fiberglass working trays behind appropriate lead shielding.

C. Handling Equipment:

Apparatus such is lead shielding, automatic pipets with disposable tips, disposable plastic gloves, and non-porous beach top trays containing plastic lined absorbent pads are to be used.



CLINICAL SCIENCE LABORATIJRY, INC. 24 PRANOIS AVENUE • MANSFIELD, FIX 02048 29 PRANOIS AVENUE • MANSFIELD, FIX 02048 20 AB-6106



#### 14 B. Waste Disposal

Proposal to dispose of radioactive waste by Decay-In Storage

- The proposed storage areas is a 21 ft. x 16 ft. room located in the NE corner of the building. This room will be tocked when not in use. The building is locked outside of the usual working hours.
- 2. Within the proposed storage area, metal barrels will be used to store plastic bags containing the solid waste. Liquid waste will be stored in capped glass or plastic jars and there will also be stored in metal barrels. At the present time, it is anticipated that approximately 2-4, 25 gal. barrels of such waste are generated per month (or approximately 800 uCi). There is sufficient space in the proposed storage area to hold more than 100 such barrels. Thus, it is proposed that each filled barrel be stored for a minimum of 18 months or 9 half lives (I 125).
- Radiation levels in this area will be surveyed weekly with a survey meter and the results recorded. The survey meter has been equipped with a low gamma energy probe suitable for I 125.
- 4. In order to assure that the levels of radioactivity of the waste has decayed to background levels prior to disposal, it is proposed to do the following:
  - a. All waste will be monitored in a low background area.
  - b. A low level GM type survey meter suitable for the isotopes in use will be used. All shielding will be removed prior to monitoring.
  - c. Records of these surveys will be kept as required under CFR 20.

#### 15. RADIATION PROTECTION PROGRAM

- A. The entire program is to be supervised by the Radiation Protection Officer.
- B. Film badges or bracelets, monitored on a monthly basis, will be worn at all times by appropriate personnel.
- C. Appropriate radiation warning signs will be posted according to Title 10 CFR part 20.
- D. Instructions will be given to personnel according to Title 10 CFR part 20.
- E. Form AEC-3 (2-72) 10 CFR 20 "Notice to Employees" will be conspicuously posted in the laboratory.
- F. All applicable personnel plus each appropriate working area will be monitored at the end of each working day by the use of a Geiger counter.
- G. Approximately every month or sooner, swab testing of the appropriate areas will be undertaken.
- H. Approximately every month or sooner, detailed surveys of the laboratory areas will be undertaken by the use of a Geiger counter.
- Records will be kept on personnel, surveys, receipt of by-product materials, disposal of by-product materials, etc. according to Title 10 CFR part 20.
- J. Licensed by-product materials will be housed in specially designated freezers or in specially designated refrigerators.
- K. Basic rules and regulations will be posted and will be as follows.
  - 1. Only necessary materials will be taken in the laboratories.
  - 2. Monitoring devices will be worn by personnel at all times.
  - 3. Persons with open wounds will not be permitted in the laboratory.
  - Eating, drinking, smoking, and application of cosmetics will be prohibiced.
  - 5. Pivetting by mouth is prohibited.
  - Protective clothing and disposable gloves will be made available in the laboratory.

- 15. Radiation Protection Program (continued)
  - Monitoring of the work areas will be done at the close of each working day.
  - 8. All cases of personnel contamination will be reported immediately.
  - 9. Radioactive wastes will be disposed of in the proper manner.
  - Hands, feet, and clothing will be monitored for contamination before leaving the laboratory.
  - Radicactive wastes will not be removed from the laboratory without prior approval.
  - 12. All accidents or injuries will be reported immediately.
  - All suggestions made by Code of Federal Regulations Title 10, part 20, Standards for Protection Against Radiation will be followed.
  - L. Waste Disposal
    - 1. Gaseous Waste

Use of gaseous by-products and disposal of by-products by gaseous discharge will be avoided. When discharge of gaseous by-products is unavoidable (i.e. decontamination of glassware from trace amounts) it will be done in a manner and in levels acceptable as published in the AEC regulations.

2. Liquid Waste

Liquid waste will not be disposed of by flushing into the sewer system. Instead, it will be collected in bottles and allowed to decay to background.

3. Solid Waste

All solid waste will be stored in plastic bags in metal barrels. Radioactive iodine solid waste will be stored in metal barrels until the level of radioactivity decreases to that of background. If the quantity of in-house isotopes begins to approximate that of the license limits, radioactive iodine solid waste will be disposed of by Interex Corporation, Natick, MA. Interex Corporation is an authorized licensee of NPC. Tritium waste will be disposed of only by use of Interex Corp. steel drums.

- 15. Radiation Protection Program (continued)
  - M. Sealed sources will be checked for leakage by swab testing once a month.
  - N. Radioactive materials are ordered either verbally by telephone as needed or via a predetermined standing order. Materials thus ordered are delivered by U.P.S. or some other commercial carrier or received at the post office during our daily visits. Upon receipt at the laboratory, packages containing radioactive materials are delivered to a package receiving area. The outsides of the packages are monitored for radioactivity using a survey meter equipped with an appropriate probe. After monitoring the outsides of the packages and recording the results, the boxes are opened and the inner containers are checked for contamination. These results are recorded into our isotope log book. After determining that there is no contamination or leakage, the actual amount of microcuries are then added into our isotope inventory. These records are always available and updated on a daily basis.
  - 0. When a spill occurs, the radiation protection officer or one of the laboratory co-directors, is notified immediately. Any spilled material will be wiped up quickly and thoroughly at ! the contaminated substances transferred to a suitable receptacle. Disposable gloves and disposable lab coats are available for this purpose. The s rfaces involved will be washed thoroughly with an appropriate decontaminant. This will be followed up by survey meter monitoring and/or wipe test evaluation. All information pertaining to spillages will be recorded.
  - P. On the first day of employment, all personnel, including technologists, clerical, housekeeping, and maintenance personnel receive overall safety instructions. Part of this instruction is devoted to our radio-immunoassay/radioisotope program especially as it pertains to Section 19. 12 of 10 CFR Part 19. In addition to the initial instructions, periodic refresher instructions are provided on at least an annual basis.

# Louis P. Amoruso, Ph.D., Asst. Tech. Director

Part	Where Trained	Duration	On the Job	Formal Course
16a	Dept. of Chemistry Boston College Chestnut Hill, MA (1970)	3 months	yes	no
16b,c,d	Boston Medical Lab. 19 Bay State Road Boston, MA (1971-1974) and	3 years	yes	no
	15 Lunda Street Waltham, MA (1974-1977)	3 years		

17. Experience with Radiation

Isotope	Max. Amount	Where Exper. Gained	Duration	Type of Use
125 <sub>T</sub>	6 millicuries	Boston Med.Lab.(BML)	4 years	in vitro
	12 millicuries	Clinical Science Lab.	10 years	in vitro
14 <sub>C</sub>	2 millicuries	BML	18 months	in vitro
3 <sub>H</sub>	1 millicurie	BML	3 years	in vitro

# Stanley G. Elfbaum, Ph.D., Tech. Director

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Part	Where Irained	Duration	On the Job	Formal Course
16a	Northwestern U.(NWU) (1965) Gillette Co.Res.Inst.(GCRI) (1966-1971)	6 months 5 years	no yes	yes no
16b	NWU	6 months	yes	yes
	GCRI	5 years	yes	no
16c	NWU	6 months	yes	yes
	GCRI	5 years	yes	no
16d	NWU	6 months	yes	yes
	GCRI	5 years	yes	no

17. Experience with Radiation

Isotope	Max, Amount	Where Exper, Gained	Duration	Type of Use
32p	25 microcuries	NWU	6 months	in vitro
14 <sub>C</sub>	25 microcuries	GCRI & Boston Med.Lab. (BML)	9 years	in vitro
125 <sub>I</sub>	6 millicuries 12 millicuries	BML Clinical Science Lab.	6 <b>y</b> ears 10 years	in vitro in vitro
131 <sub>I</sub>	1 millicurie	BML	2 years	in vitro
3 <sub>H</sub>	1 millicurie	BML	6 years	in vitro

\*BETWEEN: C. James Holloway, Chief License Fee Management Branch Office of Resource Management

> John E. Glenn, Chief Nuclear Materials Safety & Safeguards Section B Division of Radiation Safety and Safeguards

LICENSE FEE TRANSMITTAL

A. REGION T

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1. APPLICATION ATTACHED

Applicant/Licensee:

Application Dated:

Control No.:

License No.:

2. <u>FEE ATTACHED</u> Amount:

Check No.:

3. COMMENTS

incl -19

03012496

107028 20-7284-01

Signed Date

## B. LICENSE FEE MANAGEMENT BRANCH

1. Fee Category and Amount:

2. Correct Fee Paid. Application may be processed for:

Amendment \_\_\_\_\_ Renewal \_\_\_\_\_

License

Signed
Date

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New England Nuclear NES-1355 Indine 129 .000107 The Nucleus Inc. Am 241 .000037 .