

1 **Metabolism, Excretion, and Mass Balance of [¹⁴C]-Rezafungin in Animals and Humans**2 Voon Ong^{a#}, Sarah Wills^b, Deborah Watson^c, Taylor Sandison^a, Shawn Flanagan^a3 ^a Cidara Therapeutics, Inc., San Diego, CA, USA, 921214 ^b Labcorp, Madison, WI, USA, 537045 ^c QPS, LLC, Newark, DE, USA, 19702

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19 **ABSTRACT**

20 Rezafungin is a novel echinocandin being developed for treatment of candidemia and invasive
21 candidiasis and for prevention of invasive fungal disease caused by *Candida*, *Aspergillus*, and
22 *Pneumocystis* spp. in recipients of blood and marrow transplantation. Studies using [¹⁴C]-
23 radiolabeled rezafungin were conducted in rats, monkeys, and humans to characterize the mass
24 balance, excretion, and pharmacokinetics of [¹⁴C]-rezafungin and to evaluate relative amounts of
25 rezafungin metabolites compared with parent drug. Fecal excretion was the main route of
26 elimination in rats, monkeys, and humans. Radioactivity was primarily excreted as unchanged
27 drug, with $\geq 95\%$ average total recovery in rats (through 336 hours) and monkeys (through 720
28 hours). In humans, cumulative recovery of radioactivity through the first 17 days was 52% (38%
29 in feces, 14% in urine) with estimated mean overall recovery through Day 60 of 88.3% (73% in
30 feces, 27% in urine). The clinical pharmacokinetics of rezafungin following a single 400-mg
31 intravenous infusion (200 μ Ci of [¹⁴C]-rezafungin) were similar in plasma, plasma total
32 radioactivity, and whole blood total radioactivity. Unchanged rezafungin represented the
33 majority of total radioactivity in plasma, and the partitioning of total radioactivity into red blood
34 cells was negligible. Across species, rezafungin was primarily metabolized by hydroxylation of
35 the terphenyl, pentyl ether side chain. In these excretion/mass balance, metabolism, and PK
36 studies, clinical observations were consistent with findings in the rat and monkey demonstrating
37 the minimal metabolism and slow elimination of rezafungin after intravenous administration,
38 with fecal excretion as the major route of elimination.

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40

41 **INTRODUCTION**

42 Rezafungin is a novel echinocandin that classically inhibits production of 1,3- β -D-glucan in the
43 fungal cell wall and is distinguished by next-generation pharmacokinetics (e.g., long half-life and
44 front-loaded plasma drug exposure, extensive distribution and penetration to sites of infection)
45 that allow for once-weekly intravenous dosing and may confer greater antifungal efficacy (1).

46 Rezafungin has a broad spectrum of activity against *Candida* and *Aspergillus* species, including
47 *Candida auris* and subsets of drug-resistant fungal strains, and has demonstrated treatment and
48 prophylactic efficacy in animal models of candidiasis, aspergillosis, and *Pneumocystis*
49 pneumonia (2-11).

50 Rezafungin has demonstrated safety and tolerability comparable to that of currently available
51 echinocandins. Further, rezafungin has demonstrated chemical and metabolic stability and no
52 hepatotoxicity compared with anidulafungin (12, 13). The clinical database on rezafungin safety
53 includes Phase 1 trial data not available for the existing echinocandins as such evaluations were
54 not included in their drug development; these rezafungin trials showed its lack of effect on the
55 QT interval and low risk of DDIs with commonly co-administered drugs (14, 15). The
56 completed Phase 2 treatment trial of rezafungin compared with caspofungin (STRIVE;
57 NCT02734862) met its primary objective of safety. Two phase 3 trials of rezafungin are
58 currently underway, one in the treatment of candidemia and invasive candidiasis (ReSTORE
59 (NCT03667690) and one in the prevention of invasive fungal disease caused by species of
60 *Candida*, *Aspergillus*, *Pneumocystis* in recipients of blood and marrow transplantation
61 (ReSPECT; NCT04368559).

62 Using non-radiolabeled rezafungin, tissue/plasma AUC_{0-120h} ratios in rats following IV
63 administration indicated rezafungin exposures relative to plasma were comparable for highly
64 perfused major organs and approximately 4- to 5-fold higher in kidney, lung, liver, and spleen
65 than in plasma (16). Subsequently, additional studies using [¹⁴C]-radiolabeled rezafungin were
66 conducted in the rat, monkey and humans to characterize the mass balance, excretion, and PK of
67 [¹⁴C]-rezafungin. Radiolabel metabolite identification and profiling was also conducted to
68 quantify relative amounts of rezafungin metabolites compared with parent drug.

69

70 **RESULTS**

71 **Rat Excretion/Mass Balance**

72 The primary route of elimination of radioactivity in intact (non-bile duct-cannulated) rats was in
73 the feces, which accounted for a mean of 70% of the administered dose. An average of 14% and
74 2.5% of the administered dose was recovered in the urine and cage residues, respectively, and an
75 average of 7.9% of the administered dose was recovered in the carcass at 336 hours postdose.
76 The average total recovery of radioactivity was 95% of the administered dose as shown in Figure
77 1 (top). In bile duct-cannulated rats, the primary route of elimination of radioactivity after a
78 single IV dose of [¹⁴C]-rezafungin was also in the feces (mean of 35% of the administered dose),
79 which suggests passive diffusion of [¹⁴C]-rezafungin-derived radioactivity from the small
80 intestine. An average of 17%, 14%, and 1.2% of the administered dose was recovered in the bile,
81 urine, and cage residues respectively, and an average of 30% of the administered dose was
82 recovered in the carcass. The average total recovery of radioactivity in bile duct-cannulated rats
83 was 98% of the administered dose.

84 **Monkey Excretion/Mass Balance**

85 Excretion of [¹⁴C]-rezafungin derived radioactivity in urine and feces was sustained with an
86 average total recovery at 168 hours (1 week) postdose of 47.02% of the dose. The mean total
87 recovery gradually increased per day to 65% of the dose through 360 hours postdose and to 74%
88 of the dose through 720 hours postdose as shown in Figure 1 (bottom). Similar to the rat, the
89 primary route of elimination of radioactivity was in the feces, which accounted for 60% of the
90 administered dose at 720 hours postdose. A total of 9.7% and 4.3% of the administered dose was
91 recovered in the urine and cage residue, respectively.

92 Following a single IV 20-min infusion, maximum blood and plasma radioactivity concentrations
93 were observed at 0.5 hours (30 minutes) postdose, the time of the first postdose sample
94 collection. Individual blood-to-plasma concentration ratios ranged from 0.86 to 1.7 and generally
95 were approximately 1 across time-points with a ratio of blood-to-plasma AUC also of
96 approximately 1, suggesting that rezafungin had limited partition into the cellular fraction of
97 whole blood.

98 **Human Excretion/Mass Balance**

99 *Subjects.* Nine (9) healthy male subjects (average age, 41 years) received a single IV 400-mg
100 rezafungin infusion containing 200 μ Ci of [¹⁴C]-rezafungin. Of the 9 subjects, 4 (44.4%) were
101 Black/African American, 4 (44.4%) were White, and 1 (11.1%) was Asian. Seven (77.7%)
102 subjects were of non-Hispanic or Latino ethnicity. The median height, weight, and BMI of
103 subjects were 182.1 cm, 81.1 kg, and 24.1 kg/m², respectively.

104 *Clinical Safety.* A total of 13 treatment-emergent adverse events (TEAEs) were reported in 5
105 subjects. The most common TEAE by PT was diarrhea, occurring in two subjects; all other

106 events occurred in a single subject. All TEAEs were mild except for a single event of moderate
107 muscle tightness in one subject. There were no severe TEAEs. The only TEAEs considered by
108 the Investigator to be related to study treatment were a single event of mild constipation and a
109 single event of mild infrequent bowel movements in one subject each. There were no deaths or
110 other SAEs during the study, and no subjects withdrew from the study due to a TEAE. There
111 were no clinically relevant treatment-related findings observed for laboratory assessments, vital
112 signs measurements, ECGs, or physical examinations.

113 *Clinical Pharmacokinetics.* Rezafungin concentrations and [¹⁴C]-rezafungin equivalents were
114 quantifiable at all scheduled postdose collections through Day 60. Ratios of whole blood to
115 plasma total radioactivity ranged between 0.86 to 1.0 through Day 60, indicating that [¹⁴C]-
116 rezafungin did not predominantly partition into the cellular fraction of whole blood and remained
117 mainly in the plasma.

118 Pharmacokinetic parameters (see Table 1) were similar between rezafungin in plasma, plasma
119 total radioactivity, and whole blood total radioactivity. The rezafungin AUC accounted for the
120 majority of the radiocarbon AUC in plasma.

121 *Mass Balance.* Radioactivity was primarily excreted in feces during the in-clinic portion (first 17
122 days) of the study; cumulative recovery of radioactivity from excreta collected through the first
123 17 days was 52% (38% in feces, 14% in urine), highlighting the slow overall elimination of
124 rezafungin. Based on interpolated data (using data from the subjects' return visits to the CRU on
125 Day 29 and Day 60), it was estimated that the majority of the dose (an overall mean estimate of
126 88.3%) would have been recovered had the subjects been continuously confined to the clinic
127 through Day 60. Approximately 73% of this total was recovered in feces while the total in urine
128 was 27%, indicating that elimination is primarily nonrenal.

129 **Comparative Metabolism**

130 In general, rezafungin was metabolized by hydroxylation of the terphenyl, pentyl ether side chain
131 in forming three hydroxylated metabolite isomers, namely, 2'-, 3'-, or 4'-hydroxylpentyl

132 rezafungin. A second biotransformation observed involved the loss of the pentyl group via *O*-
133 dealkylation to form metabolite despentyl-rezafungin (Figure 2). Subsequent conjugation

134 (sulfation) of the hydroxyl metabolites was observed to a minimal extent.

135 The metabolite profile of rat plasma samples showed primarily unchanged parent drug (56% of
136 total plasma radioactivity exposure), although hydroxylated metabolites, 4'-hydroxylpentyl

137 rezafungin and 2'-hydroxylpentyl rezafungin, were detected at low levels at later time points (≥ 4
138 hr) and amounted to about 33% and 11% over the same time period, respectively. In rat feces

139 and bile, unchanged parent drug was the predominant radioactive component. In contrast, rat
140 urine comprised mainly of hydroxylated metabolites, 4'-hydroxylpentyl rezafungin (62%), 3'-
141 hydroxylpentyl rezafungin (1.9%) and 2'-hydroxylpentyl rezafungin (7.8%), as well as the *O*-
142 dealkylated metabolite, despentyl-rezafungin (28%) of total recovered radioactivity.

143 Similar to the rat, unchanged parent was the major circulating component (74% of total plasma
144 radioactivity exposure) observed in monkey plasma with metabolites 4'-hydroxylpentyl

145 rezafungin, 3'-hydroxypentyl rezafungin, and 2'-hydroxylpentyl rezafungin calculated to be
146 8.3%, 6.3%, and 3.0% over the same time period, respectively. In monkey feces, unchanged

147 parent was the major radioactive component observed representing 35% of the total recovered
148 radioactivity with the observed highest metabolite, despentyl-rezafungin, representing 25% of
149 total recovered radioactivity. Hydroxylated and subsequently sulfated hydroxyl metabolites

150 accounted for 4 to 22% of total recovered radioactivity. Excretion in monkey urine comprised
151 mainly of hydroxylated metabolites, 4'-hydroxylpentyl rezafungin (42%), 3'-hydroxylpentyl

152 rezafungin (12%) and 2'-hydroxylpentyl rezafungin (25%), as well as the *O*-dealkylated
153 metabolite, despentyl-rezafungin (22%) of total recovered radioactivity.

154 The primary metabolic pathways of rezafungin in humans reflected what was observed for the rat
155 and monkey. Metabolism of rezafungin was localized predominantly to the pentoxy side chain
156 and was mediated primarily by hydroxylation. *O*-dealkylation and sulfation were comparatively
157 minor primary and secondary biotransformation pathways. In human plasma, rezafungin was the
158 most abundant circulating component, calculated at 69% of the total plasma radioactivity
159 exposure. Hydroxylated metabolites, 4'-hydroxylpentyl rezafungin, 3'-hydroxypentyl
160 rezafungin, and 2'-hydroxylpentyl rezafungin, were the most abundant circulating metabolites,
161 comprising 9.8%, 5.5%, and 6.9% of total plasma radioactivity exposure, respectively.

162 Unchanged rezafungin was the major radioactive component in human feces, accounting for
163 90% of total recovered radioactivity, while trace to minor amount of rezafungin metabolites
164 cumulatively accounted for the rest. The hydroxy rezafungin sulfate conjugate was the most
165 abundant, albeit minor, fecal metabolite and accounted for 4.3% of the total recovered
166 radioactivity. Elimination of unchanged rezafungin in urine was negligible while metabolites,
167 4'-hydroxylpentyl rezafungin, 3'-hydroxypentyl rezafungin, 2'-hydroxylpentyl rezafungin, and
168 despentyl rezafungin, were the most abundant excreted in urine, comprising 49%, 6.2%, 28%,
169 and 13% of the total recovered radioactivity in urine, respectively.

170 **DISCUSSION**

171 The objective of these studies was to conduct definitive experiments to investigate the
172 pharmacokinetics, metabolism, and mass balance of rezafungin in preclinical species used for
173 safety testing, rats and monkeys, as well as in human.

174 In animals and human, plasma radioactivity profiles indicate very slow elimination following IV
175 administration of [¹⁴C]-rezafungin. In the rat and monkey, mean plasma total radioactivity
176 concentrations decreased slowly over time with $t_{1/2}$ values of 54 hours and 170 hours,
177 respectively. Calculated blood-to-plasma ratios were generally close to 1 and suggest
178 approximately equal distribution of radioactivity in plasma and the cellular fraction of blood.
179 An even slower elimination profile was observed in humans, as shown in Figure 3 and Table 1,
180 with plasma radioactivity $t_{1/2}$ value of 387 hours. Mean blood/plasma concentration ratios
181 ranged from 0.86 to 1.0 through the last collection time point (day 60), confirming the
182 observation in the rat and monkey of the low association of rezafungin with blood cells (Figure
183 3).
184 Preclinical ADME studies in rats and monkeys had shown that rezafungin is primarily excreted
185 as unchanged drug in feces, with urinary excretion as a minor route (16). Across animals and
186 humans, the fraction of the total recovered radioactive dose was generally 0.74 to 0.81 in the
187 feces with sustained or prolonged elimination of radioactivity over time. For example, in
188 humans, cumulative recovery of radioactivity from excreta collected through the first 17 days
189 was 52% (38% in feces, 14% in urine), highlighting the slow overall elimination of rezafungin.
190 Even by day 60 (based on linear interpolation), overall recovery of the administered dose was
191 estimated to be less than complete at 88% (Figure 4).
192 It was interesting to note that after IV dosing, [¹⁴C]-rezafungin was also observed in the feces
193 suggesting biliary excretion, intestinal secretion, passive diffusion, or some combination.
194 Indeed, in bile duct-cannulated rats, [¹⁴C]-rezafungin also predominated in the feces (35%)
195 compared with bile (17%), suggesting a combination mechanism of slow elimination. Biliary
196 excretion has been observed for caspofungin(17) and anidulafungin(18). In the case of

197 anidulafungin, although uncommon, passive diffusion (up to 10% of dosed fraction) was
198 reported for anidulafungin, with which rezafungin shares a remarkable structural similarity.
199 The majority of the total radioactivity in plasma/feces/bile was associated with parent drug,
200 suggesting minimal biotransformation of rezafungin. In both preclinical and clinical urine
201 samples, although unchanged drug was detected in the initial/early urine samples, hydroxylated
202 metabolites were the predominant components in urine samples. These observations suggest that
203 the rate of formation of metabolites is slow and support the slower elimination of rezafungin
204 overall.

205 All three of the previously approved echinocandins (caspofungin, micafungin, and
206 anidulafungin) are believed to undergo spontaneous chemical (non-enzymatic) degradation to a
207 ring-opened peptide as their primary clearance mechanism (18). In contrast, rezafungin with a
208 quaternary ammonium side chain modification prevents the ring opening and enhances the
209 stability of the parent molecule (12), allowing for an extensively prolonged plasma half-life
210 compared with the three older echinocandins. While protein binding is generally considered a
211 factor in evaluation of half-life, rezafungin and the three approved echinocandins all demonstrate
212 comparable protein binding values (97.4% and 92.4%–99.9%, respectively)(12, 19).

213 The metabolism of rezafungin was qualitatively similar across both animal species examined
214 (Figure 5). In general, rezafungin was metabolized by hydroxylation of the terphenyl, pentyl
215 ether side chain in forming three hydroxylated metabolite isomers, namely, 2'-, 3'-, or 4'-
216 hydroxypentyl rezafungin as well as loss of the pentyl group via O-dealkylation to form
217 metabolite despentyl-rezafungin (scheme). The hydroxylated metabolites were more
218 quantifiable in monkey plasma, with the largest at about 8% of the total radioactivity as
219 measured by AUC. Subsequent conjugation of the oxidative metabolites was observed to a

220 minimal extent. In plasma and feces (or rat bile), rezafungin was the predominant compound
221 measured. Rezafungin accounts for ~77% of total radiocarbon AUC and metabolites accounted
222 for less than 10% of the total plasma radioactivity AUC exposure as shown in the concentration-
223 time profiles. In the urine, as observed in rat and monkey metabolite profiling studies, low level,
224 inactive, oxidative metabolites were identified as 2'-, 3'-, 4'-hydroxypentyl rezafungin, and
225 despentyl-rezafungin.

226 A similar metabolism profile was observed in human samples, in which parent drug was
227 predominant. Unsurprisingly, results from the human excretion/mass balance, metabolism and
228 PK study are consistent with nonclinical results, which showed fecal excretion as the major route
229 of elimination of [¹⁴C]-rezafungin. The effect of the low level presence of rezafungin in intestinal
230 microbiota is currently unknown and bears further study, although we do note that both
231 caspofungin and anidulafungin undergo biliary excretion, implying that a small fraction of the
232 dose is continually present in the intestinal tract and eliminated as unchanged drug in the
233 feces(17, 18). Overall, rezafungin underwent minimal metabolism and slow elimination after an
234 intravenous administration. In conclusion, rezafungin displays similar disposition and
235 metabolism properties in preclinical species and in humans.

236 MATERIALS AND METHODS

237 All studies that involved animals were approved by an Institutional Animal Care
238 and Use Committee and were conducted in compliance with appropriate local
239 health regulations and ethical approval.

240 **Chemicals.** For the rat and monkey mass balance study, [¹⁴C]-rezafungin (46.53 µCi/mg;
241 radiochemical purity, 99.6%) was synthesized by Moravek (Brea, CA) as a bulk powder, which

242 was compounded with unlabeled rezafungin manufactured by Bachem Americas, Inc. (Torrance,
243 CA) as a solution in a vehicle of 2.5% Tween 80, 5% mannitol, 0.3% glacial acetic acid adjusted
244 to pH 4.5.

245 For the human mass balance study, [¹⁴C]-rezafungin (5.7 µCi/mg; radiochemical purity, 94.3%)
246 was synthesized by ViTrax (Placentia, CA) as a bulk powder, which was compounded with
247 unlabeled rezafungin manufactured by Bachem Americas (Torrance, CA).

248 The chemical structure of rezafungin with the radiocarbon position is depicted in Figure 6.

249 Chemical standards of the hydroxylated (2'-, 3'-, and 4'-hydroxy) and despentyl metabolites of
250 rezafungin were synthesized and supplied by Hypha (Oxfordshire, UK). Chemicals, reagents,
251 and HPLC grade solvents were obtained from commercial sources.

252 **Rat/Monkey mass balance.**

253 *Rat Study Design.* The study used 12 male Sprague-Dawley rats, each administered a bolus IV
254 injection into the tail vein over approximately 3-4 minutes of 15 mg/kg of rezafungin (with a
255 target radioactivity of 200 µCi/kg of [¹⁴C]-rezafungin). Three of the rats were bile duct-
256 cannulated. Whole blood/plasma, urine, feces/bile, and cage washings were collected at periodic
257 intervals from noncannulated rats until euthanization at 336 hours postdose and from bile duct-
258 cannulated rats until euthanization at 120 hours postdose as that was the duration that the patency
259 of bile duct cannulae could be maintained. Carcasses were collected at the time of euthanization.
260 All samples were analyzed for drug-derived radioactivity by liquid scintillation counting.

261 *Monkey study design.* The study used 3 male cynomolgus monkeys, each administered a single
262 10 mg/kg IV dose of [¹⁴C]-rezafungin (with a target radioactivity of 100 µCi/kg of [¹⁴C]-
263 rezafungin) by infusion into a saphenous vein over 20 minutes. Whole blood and plasma samples

264 were collected at each of the following time points: predose, 0.5, 2, 4, 8, 24, 48, 96 120, 144,
265 168, 240, 480, 720, and 1440 hours postdose. Urine, feces, and cage washings were collected at
266 predose (urine/feces only) and daily 24-hour collections for 30 days.

267 *Sample Analysis.* Whole blood and fecal homogenates were combusted prior to analysis by liquid
268 scintillation counting (LSC). Blood, plasma, bile, urine, cage rinse/wash, and fecal homogenate
269 samples were mixed with scintillation fluid and analyzed for radioactivity by LSC. Rat carcasses
270 were dissolved in potassium hydroxide, and the resulting digests were mixed with scintillation
271 fluid and analyzed for radioactivity by LSC.

272 *Metabolite Profiling.* The metabolite identification and urine profiling was achieved using
273 pooled samples by equal percent weight of samples (urine, bile, feces) or by equal volume (50
274 μ L) aliquots of each plasma sample across all time points/intervals. The urine, plasma, bile, and
275 fecal samples were analyzed using liquid chromatography tandem mass spectrometry (LC-MS)
276 coupled with a radioactivity flow-through detector for metabolite profiling and identification.
277 Tandem MS experiments were performed, and the structures of the metabolites were proposed
278 based on their MS/MS spectra. The proposed structures were confirmed by comparison of the
279 retention times and product ion spectra with the authentic reference standards when possible.

280 **Human mass balance.**

281 *Study Design.* This was an open-label, phase I, single-dose mass balance study. The study was
282 conducted at Labcorp (formerly, Covance, Inc.; Madison, WI) in accordance with good clinical
283 practice, including ICH guidelines and applicable regulatory requirements, and in general
284 conformity with the Declaration of Helsinki. No animal work was conducted by Labcorp. All
285 pertinent study documents were reviewed by the Institutional Review Board (IRB) prior to study
286 initiation. Following IRB approval and collection of written informed consent, all the subjects

287 underwent an initial screening assessment within 28 days of the first dose. Safety was assessed
288 by vital signs, physical examinations, AE assessments, laboratory tests (chemistry, hematology,
289 and urinalysis), and a 12-lead electrocardiogram.

290 Subjects were initially confined in the clinical research unit (CRU) for 17 days postdose and
291 returned for two follow-up visits (days 29 and 60). Recovery of radioactivity was estimated by
292 linear interpolation during the period of time subjects were away from the CRU. Blood samples,
293 urine, and feces were collected at specified times over 60 days.

294 *Sample Analysis.* Whole blood, plasma, urine, and fecal homogenate samples were mixed with
295 scintillation fluid and analyzed by liquid scintillation counting. For non-radiolabeled rezafungin
296 concentration determination, a bioanalytical method was validated for measuring rezafungin in
297 human plasma that is similar to one previously reported for animal plasma (16). Samples were
298 analyzed using a 100 μ L aliquot volume and a protein-precipitation extraction procedure
299 followed by liquid chromatography/tandem mass spectrometry (LC-MS/MS) analysis.

300 Chromatography was carried out on a Waters Atlantis HPLC column (dC18, 2.1 x 50 mm, 5 μ m)
301 operating under reverse-phase gradient conditions (0.1% formic acid in water/0.1% formic acid
302 in acetonitrile/tetrahydrofuran ramped from 55%/45%/0% to 5%/0%/95%). Rezafungin
303 calibration range was 10.0 ng/mL to 10,000 ng/mL using isotopically-labeled *d*9-rezafungin as
304 an internal standard. An AB-Sciex API 4000 mass spectrometer was operated in the multiple
305 reaction monitoring mode (parent-to-product ion transition) under optimized conditions for
306 detection of rezafungin (m/z 604.5 to 343.3 Da) and *d*9-rezafungin (m/z 609.5 to 343.3 Da)
307 positive ions formed by electrospray ionization. Excellent intra- and inter-assay accuracy and
308 precision, as measured by quality control (QC) samples, was obtained during validation. Across
309 the range of QC samples tested (lower limit of quantitation, LLOQ, through the High QC range),

310 the intra-assay accuracy (% bias from nominal) ranged from -1.4% to 7.0% with the intra-assay
311 precision (% coefficient of variation) ranging from 1.6% to 7.4%. Inter-assay accuracy ranged
312 from 0.3% to 4.3% with the inter-assay precision ranging from 2.7% to 5%.

313 *Metabolite Profiling.* Plasma samples were pooled across subjects through 672 hours postdose to
314 produce inter-subject time point pools. Urine and fecal homogenate samples were pooled by
315 subject across various time points up through 408 and 672 hours postdose, respectively. Selected
316 samples of plasma, urine, and feces were profiled for rezafungin and metabolites by HPLC with
317 radiochemical and high-resolution mass spectrometry detection; metabolites were identified by
318 HPLC with known standards and/or by HPLC-MS/MS structure elucidation. Pharmacokinetics
319 were calculated by non-compartmental analysis using Phoenix WinNonlin software (Version
320 6.3/8.1; Pharsight, Mountain View, CA).

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328 SF, TS are employees and shareholders of Cidara Therapeutics, Inc. Labcorp (formerly Covance)
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333

334 **TABLES**335 **Table 1. Summary of Mean (SD) Pharmacokinetic Parameters for Rezafungin, Plasma**336 **Total Radioactivity, and Whole Blood Total Radioactivity for Human Subjects.**

Parameter ^a	Plasma Rezafungin	Plasma Total Radioactivity	Whole Blood Total Radioactivity
AUC _{0-t} ^b	2050 (137)	2600 (163)	2390 (175)
AUC _{0-∞} ^b	2110 (141)	2750 (182)	2450 (200)
C _{max} (μg/mL)	18.9 (2.50)	18.2 (2.28)	18.5 (2.24)
t _{max} (hours)	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)	1.00 (1.00, 1.00)
t _{1/2} (hours)	341 (42.8)	387 (44.8)	408 (39.7)
CL (L/hour)	0.180 (0.131)	NA	NA
V _Z (L)	88.6 (12.0)	NA	NA

Abbreviations: AUC_{0-t} = area under the concentration-time curve from 0 to the last measurable concentration; AUC_{0-∞} = AUC extrapolated to infinity; C_{max} = maximum observed concentration; CL = apparent systemic clearance; max = maximum; min = minimum; SD = standard deviation; t_{max} = time to maximum observed concentration; t_{1/2} = terminal elimination half-life; V_Z = apparent volume of distribution based on the terminal elimination phase.

a. Results are reported as arithmetic mean (SD), except for t_{max} which is reported as median (min, max).

b. Units are μg×hour/mL for rezafungin, μg equivalent×hour/mL for plasma and whole blood total radioactivity.

337

338

339 **FIGURE LEGENDS**

340

341 **Figure 1.** Cumulative mean recovery of radioactivity from rat (top) and monkey (bottom)
342 collected through 30 days.

343 **Figure 2.** Scheme of rezafungin metabolism

344 **Figure 3.** Mean conc-time profiles (top: linear; bottom: semi-log) for whole blood/plasma
345 radioactivity and plasma rezafungin for human subjects.

346 **Figure 4.** Cumulative recovery (mean +/- standard deviation) of radioactivity from human
347 excreta collected through the first 17 days (top) and by day 60 based on linear interpolation
348 (bottom).

349 **Figure 5.** Plasma conc-time profiles of plasma radioactivity for rat, monkey, and human.

350 **Figure 6.** Position of radiolabel on ^{14}C -rezafungin.

351

352

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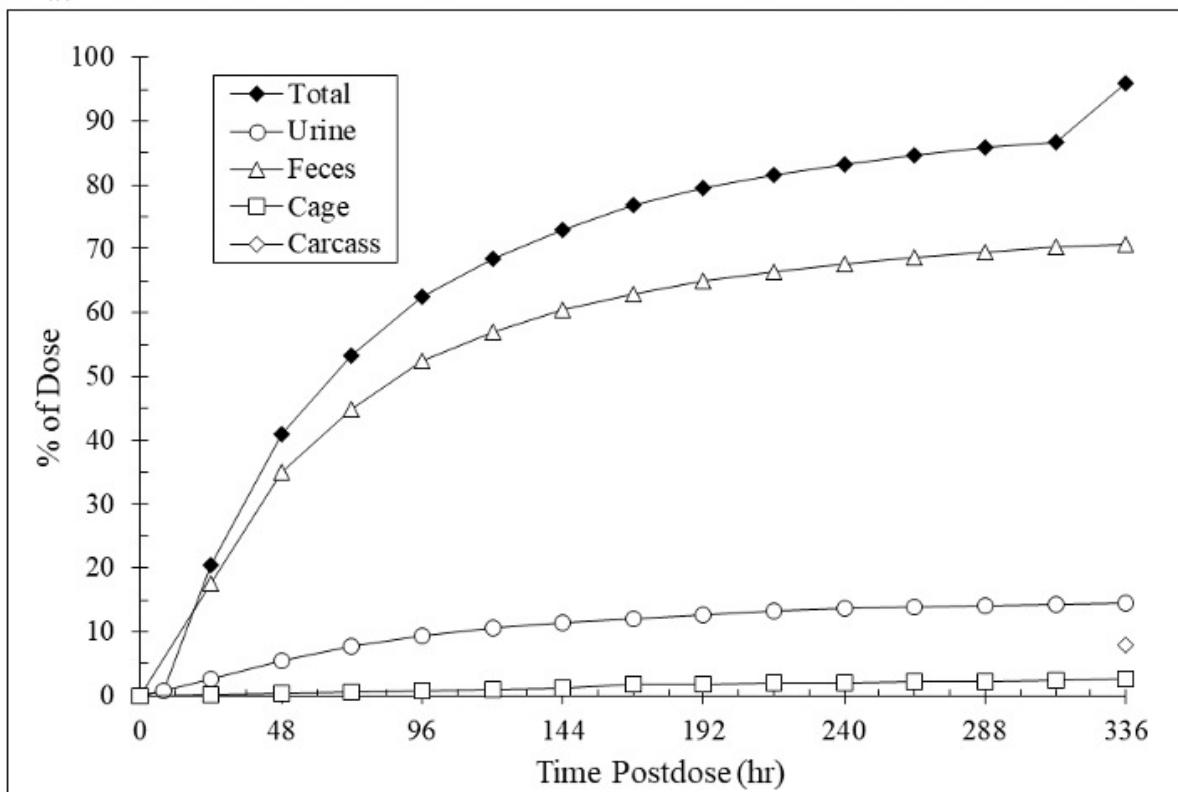
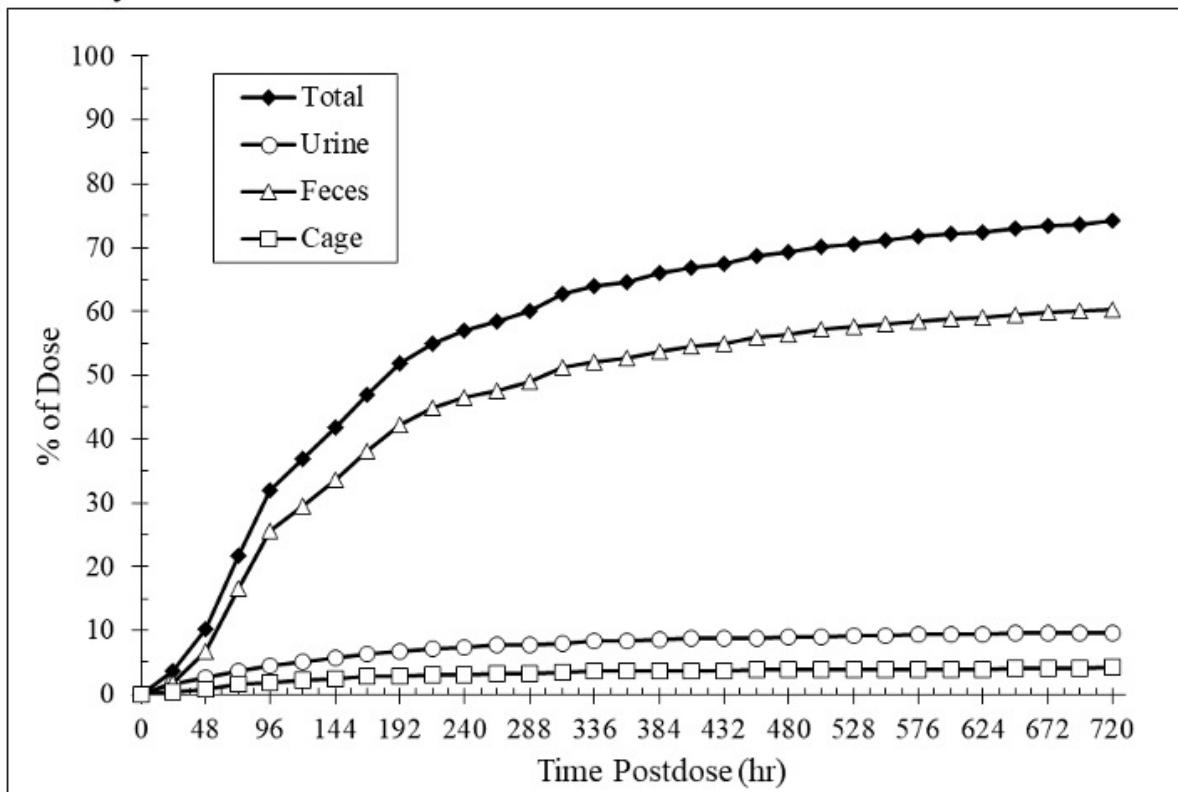
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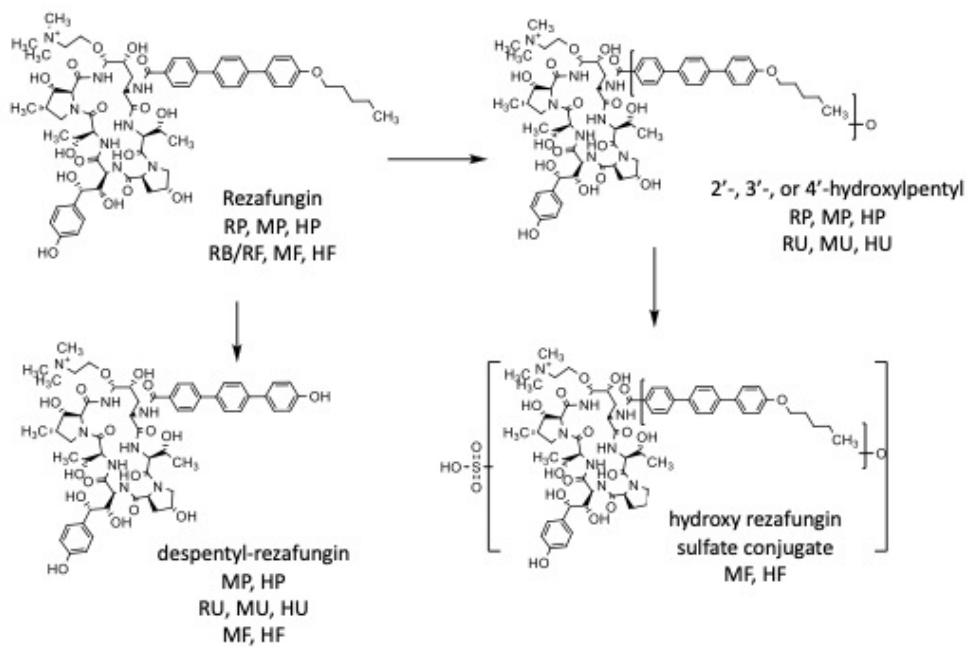
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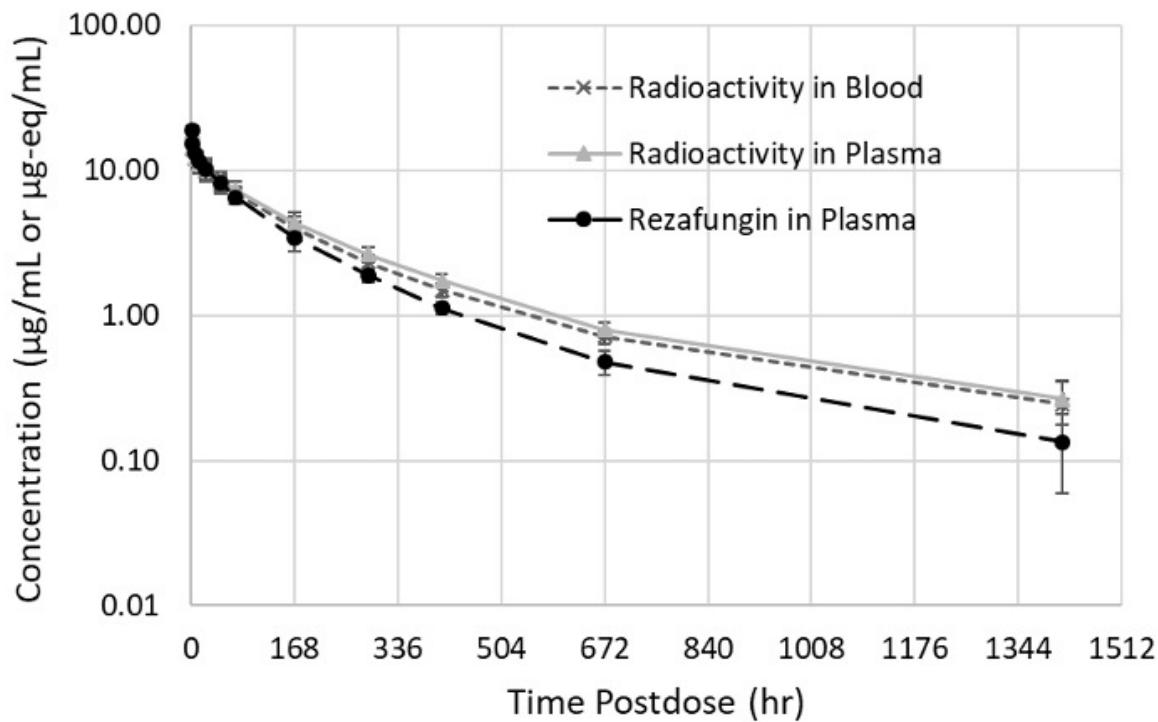
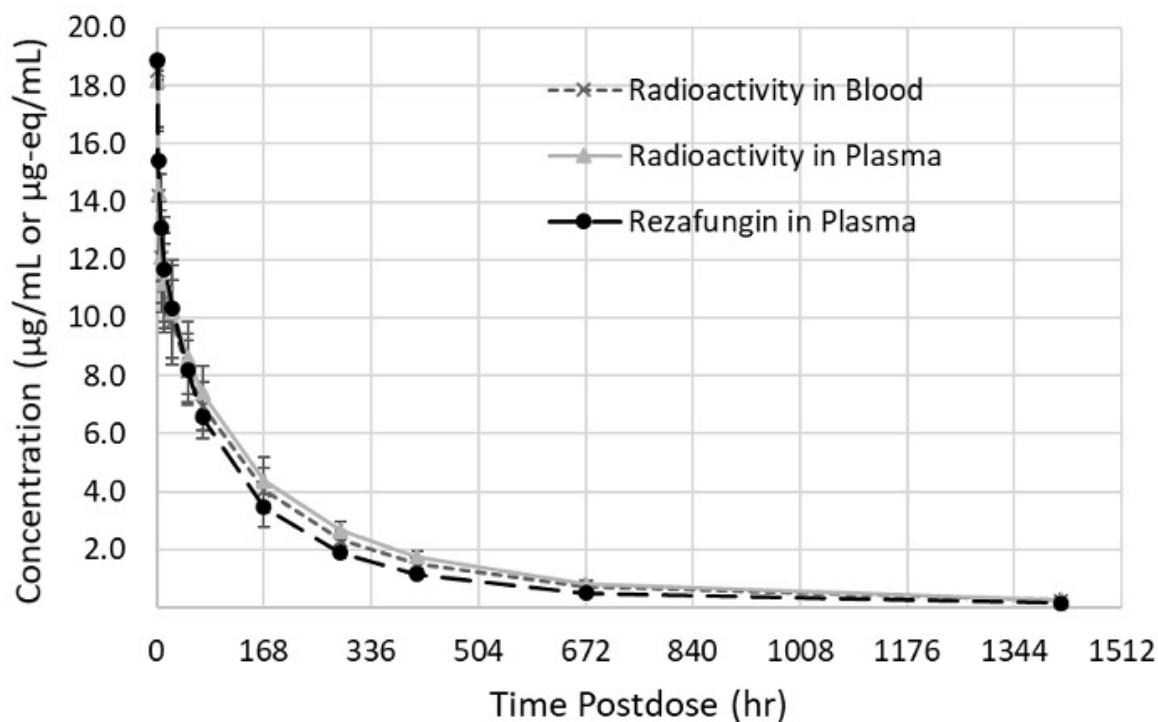
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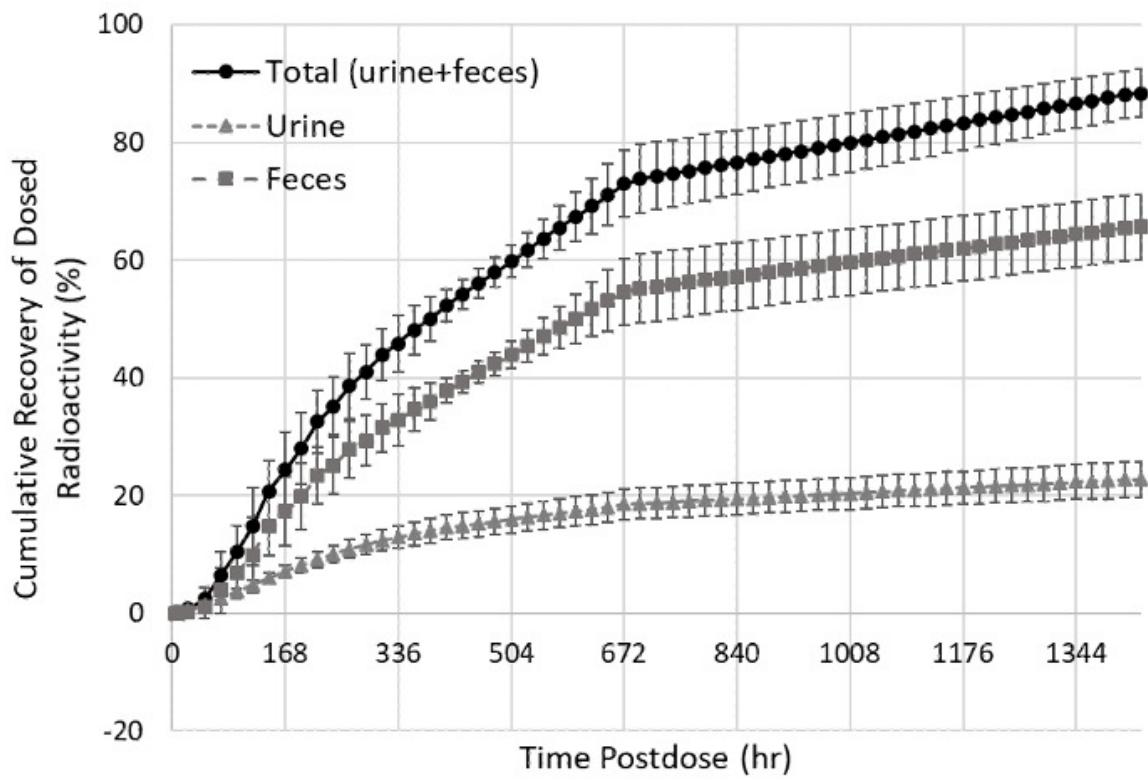
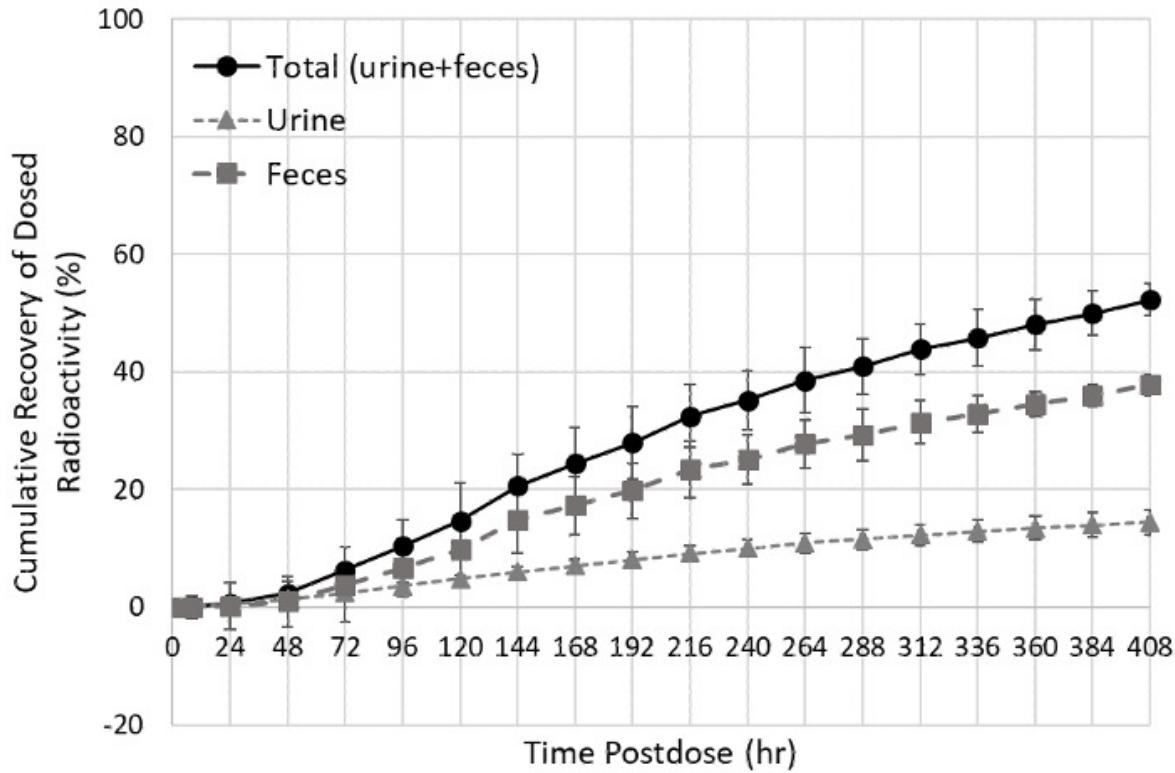
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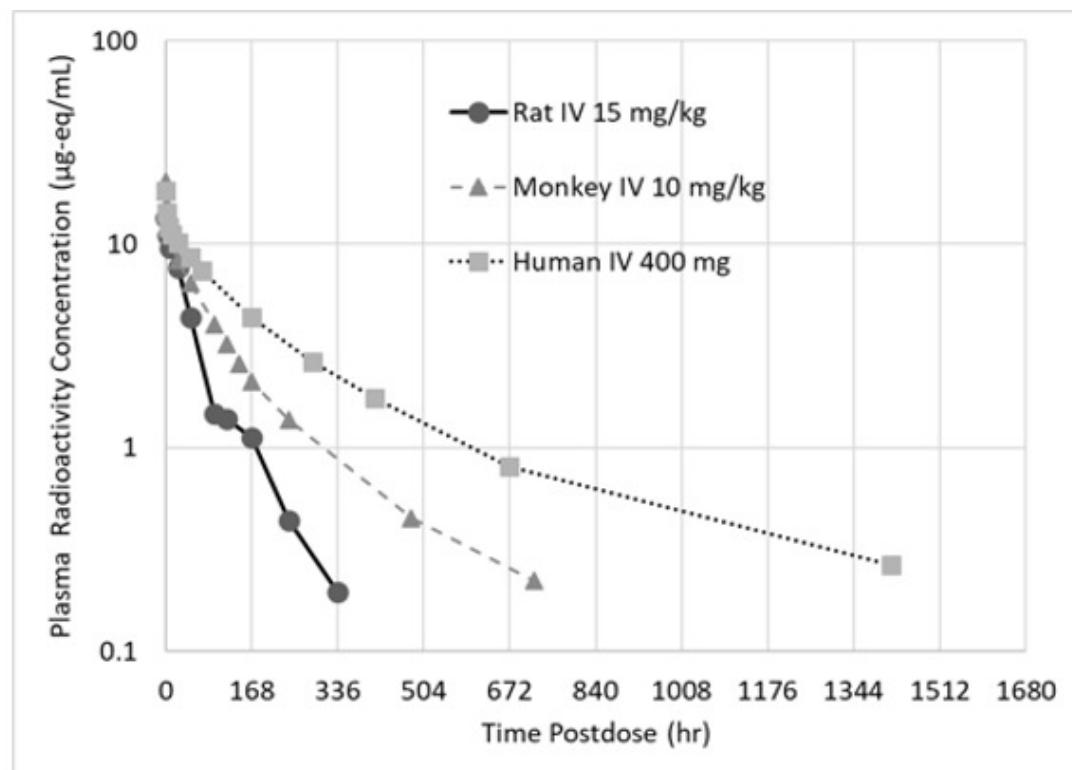
Rat**Monkey**



R=Rat, M=Monkey, H=Human; P=Plasma, U=Urine, B=Bile; F=Feces







*Radiolabel position

